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ANNALS OF SURGERY

A MONTHLY REVIEW OF SURGICAL SCIENCE AND PRACTICE.

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ANNALS OF SURGERY.

SURGICAL TREATMENT OF TUMORS OF THE BLADDER.¹

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THAT the bladder may be the seat of a morbid growth, has been known from the earliest times, but only recently has the treatment of vesical neoplasm been other than medical and symptomatic, general or local, intended to relieve pain, arrest hæmorrhage and remove existing irritation or inflammation.

Though occasionally in catheterization an outgrowth had been caught and brought away, or in the course of a lithotomy a discovered tumor had been removed, though, even as far back as 1639, Covillard had done a lateral operation on account of a previously recognized growth, and two centuries later Civiale had with his trilobe seized and detached polypoid tumors, yet, surgical interference as a regular formularized method of treatment, at least in the case of a male patient, is of recent adoption and may be regarded as dating from 1874, the year in which were done the well known operations of Billroth and Volkmann; attracting the attention of surgeons generally only after the appearance of Sir Henry Thompson's papers in 1882 and 1883.

A sufficient number of cases have now been operated upon to enable us to at least fairly well determine whether or not surgical interference is proper, what it can accomplish and how best it is to be made.

Malignant neoplasms, left to themselves, must of necessity

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produce a fatal result. Non-malignant growths, though slower in action, causing, it may be, little or no disturbance for many years, are yet, as a rule, almost as certain in ultimate effect; though in a few fortunate cases they may be spontaneously cast off, or from some undetermined cause disappear.

Surgical treatment, therefore, is fully warranted if it relieves symptoms and promotes comfort; still more so if in any considerable proportion of cases complete cure follows the removal of a growth.

¹In the years 1874 to 1888, inclusive, not including 15 cases operated upon by Sir Henry Thompson but not reported in detail, 176 patients were operated upon, 124 males and 52 females, with an apparent resulting mortality of 22.7 %, 26.6 among males (124.33), and 13.46 % among females, (52.7); but of these forty deaths, thirteen occurred after the lapse of thirty or more days and are not to be attributed to the operation itself, nor are those from duodenal hæmorrhage and from perforating ulcer of the stomach, nor from suppurative kidney on the eight and nineteenth days respectively, so that not more than 23 deaths (13 %), including all those from exhaustion in the first four weeks, can be credited to surgical interference, and in a large proportion of these cases the fatal result must have been due to conditions existing prior to and at the time of the operation. The death rate, therefore, of the operation itself can justly be placed at so low a figure that it may be disregarded in determining the propriety in any given case of attempting the removal of a vesical new growth. In more than three-quarters of the cases operated upon, relief has been afforded, either permanent or for many months or years. More than once when recurrence has taken place, it has been in a region of the bladder remote from that originally affected. In almost every one of the forty cases that died, for a time, and in a considerable proportion of them for quite a while, complete freedom from pain and bleeding followed the removal of the tumor. It may then be safely declared that surgical treatment is not only justifiable, but is demanded in every case in which there is not either on the one hand great

¹For the collection and tabulation of these cases I am indebted to Dr. C. S. Evans, of Cincinnati.

mildness of symptoms that have manifested themselves only occasionally and at long intervals, or, on the other, such extreme weakness as that any interference would only hasten the rapidly approaching end, or such extensive malignant disease of the bladder or of the bladder and parts adjacent as to render it impossible to effect removal.

How best can the growth be reached and taken away? In women the shortness and dilatability of the urethra indicate that through this canal is the readiest way of getting at the tumor. Though incontinence of urine may follow rapid dilatation, it is not likely to do so; and even if it occurs, it is ordinarily but temporary. Should it last for months, it may yet spontaneously cease as it did in the case treated by Jackson.

Of the 52 cases operated upon in the fifteen years prior to 1889, in 43 the growths were reached through the dilated urethra, or at the meatus after spontaneous extrusion from the bladder. In the remaining nine, colpocystotomy or supra-pubic section was done, the former in four, the latter in five.

In males, though, as in Maas' cases, the growths have occasionally been removed by the catheter through the urethra, almost always the bladder has been opened, either by a perineal or supra-pubic incision (60 times from below, 51 times from above, in 8 cases a combined operation having been done). The mortality rate of the two operations being, probably, not very different (28.3 perineal, 29.4 supra-pubic) though there must always be some risk of peritoneal injury and resulting danger in the high section, the selection of the one or other operation should depend upon the determination of the ease with which the growth can be reached and the thoroughness with which it can be extirpated. As a diagnostical procedure the perineal operation is certainly the preferable one, except when the perineum is very deep or the prostate markedly enlarged; being simpler, quicker and safer. But a diagnosis can almost always be established by careful consideration of the symptoms present. In the majority of individuals the bladder can readily be brought within reach of the finger passed through a perineal incision, but in quite a percentage of cases it is impossible to carry the tip of the finger much beyond the urethral opening, and at times it can not be passed into the

bladder at all. In these cases there must be some, perhaps much, uncertainty in locating the growth, and difficulty in effecting anything like a thorough removal. A sessile tumor must ordinarily be operated upon by the forceps and the curette, and it may be so located as that it shall be troublesome or impossible to satisfactorily reach it and get it away, or if situated in the upper part of the bladder and brought within reach by pressure above the pubes, too extensive removal, both in width and depth, may easily be made. To cleanly exsect the growth and suture the edges of the wound produced is not practicable, or only so under rare circumstances.

By the high section, on the other hand; thorough digital exploration is rendered possible, and, if desirable, the cavity can be illuminated and the exact location and size of the tumor visually determined. The operative procedure, whether it be crushing, or scraping, or ligating, or burning, or cutting, can be done with more exactness, and portions of the bladder wall can be removed even up to one-half or two-thirds of the upper and anterior surfaces, followed by careful suturing of the accurately apposed edges. An existing prostatic overgrowth is no contra indication, but the opposite, nor is it an obstacle in the performance of the operation; and the removal of such hypertrophied mass may be at the same time effected, and that easier than through a perineal opening. Hæmorrhage can be controlled by application of a ligature to the bleeding vessel or by the use of the galvano or thermo-cautery.

Aside from the securing of thorough drainage which, as Harrison has said, is so necessary to prevent extension of a suppurative process, every advantage seems to lie with the supra-pubic operation if it can be shown that there is not connected with it a decidedly greater amount of danger to life. Though in the cases collected, the death rate has been slightly higher (29.4 % to 28.3 %), yet it must be remembered that, as a rule, the cases were more unfavorable, and the operations more extensive. In but few does it appear that the fatal result was due to traumatic peritonitis, the special danger of the high operation, or to urinary infiltration. To operate aseptically, and to treat aseptically is certainly easier with the supra-

public than the perineal method. A case of Anderson's and one of Guyon's indicate that when the growth is malignant there is a possibility that extension of the disease may be along the track of the operation-wound, with later affection of the external tissues.

As surgeons have become more familiar with the supra-pubic section and its technique has been improved, it has (and there is every reason for believing that it will yet more) become the favored operation, permitting, as it unquestionably does, a more complete removal of the growth, and in cases of cancer, of the diseased parts.

Unfortunately, only in a small minority of patients is the growth situated in the upper segment of the bladder, the portion most easily reached and cut away. Will it ever be found practicable to dissect out the whole lower segment, taking away at the same time, of course, the upper, which can no longer be of any service? If it is, it will be of great benefit to the subjects of malignant infiltration, since it has been clearly shown that the disease is, as a rule, having few exceptions, long confined to the viscus itself.

What can be done with the ureters. Experiments upon animals have shown that they may be turned into the rectum or urethra, or brought out through the skin, the latter having proved to be the safest and most satisfactory disposition of them. Upon the cadaver Gluck and Zellner were able to fasten them into the urethra, and Sonnenburg, after removal of the exstrophied bladder, successfully fixed them in the penile cleft. It is certainly desirable that further and extensive experiments should be made, and the feasibility, or otherwise, of removal of the diseased bladder determined.

In conclusion, it may be said that:

1. Only after operation is there much chance for recovery from any kind of vesical tumor.
2. That an operation should be done in all except the least and most severe cases.
3. That, as a rule, in males the bladder should be opened above the pubes.
4. That the removal should be made as complete as the situation and extent of the growth will permit.

TABLE I.—PUBLISHED OPERATIONS FOR TUMORS OF THE BLADDER OCCURRING IN WOMEN.

No Date.	Operator.	Age.	Where Reported.	Kind of Tumor.	Method of Removing Tumor.	Method of Enlarging Bladder.	Result.	Remarks.
1 1747	Warner.	23	Cases in Surgery, Lond., 1760.	Size of turkey egg.	Ligation of pedicle.	Dilatation, incision of urethra.	Recovery.	
2 17—	LeCat.		Parallèle d. l. taille latéral, Amst., 1766. Howship Urinary Organs, p. 244.			Per urethram.		
3 1834	Pleninger.	23-4	Wurt. Med. Corres., 1834, No. 23.	Papilloma.	Ligature.		Death.	Partial removal.
4 1844	Thienemann.	45	Am. Jour. of Med. Sci., 1845, 224.		"		Recovery.	Polyp protruded through the meatus.
5 1846	Guillon.		Pitha-Billroth. Chir., bd. 3 abth. 2.	Polyp.	Ligature, silver wire.		?	
6 1849	Aberle.		Tumors of Bladder. Stein. Zeitschr. f. Wund. & Geburtsh., bd. 2.		Ligature.		?	
7 1858 J.	Birkett.	5	Med. Chir. Tr., 1853, xli, 311.	Fibrous polyp.	Partial removal with ligature.		Death.	Bladder contained multiple growths. Death 25 days later from suppuration of kidneys.
8 1858	Spencer Wells.	23	Med. Tim. and Gaz., 1858, 2, 84.	Papilloma.	Blunt pointed scissors.		Recovery.	
9 1859 V.	Langenbeck.	24	Arch. f. Klin. Chir., 1859, 1, 129.	Sarcoma.	Removal piece-meal.		Death.	From peritonitis. Reported by Senfleben.
10 1860	Hall.	59	Lond. Lancet, 1860, 2, 462.	Dermoid.	Finger & scoop.		Recovery.	
11 1863	Bryant.		Br. Med. Jour., 1879, 1, 821.		Erasur.		Recovery.	
12 1868	Guesant.	22m	Gaz. d'Hop., Paris, 1868, No. 23.	Polyp.	Wire ecraseur.		Death.	On 8th day from gangrene of vulva.
13 1868	Braxton Hicks.	60	Lond. Lancet, 1867, 1, 686.	Malignant.	Forceps and ecraseur.		Improved.	

TABLE I.—CONTINUED.

No. Date.	Operator.	Age	Where Reported.	Kind of Tumor.	Method of Removing Tumor.	Method of Enlarging Bladder.	Result.	Remarks.
29 1879	Brennecke.	34	Centbl. f. Gynaek., 1879, iv, 8, Schmidt's Jahrb., Vol 185, 41.	Polyp.	Forced out by contractions of bladder.	Per urethram	Recovery.	
30 1879	Voeglin.	64	Corres. f. Schweiz. Aerzte, July, 1879	Papilloma.	Scraping with finger.	"	Recovery.	
31 1879	"	54	Corres. f. Schweiz. Aerzte, July, 1879.	"	Scraping.	"	Recovery.	
32 1879	"	56	Corres. f. Schweiz. Aerzte, July, 1879.	Fibro-sarcoma.	Finger, curette.	"	Improval.	Death one year later.
33 1880	Allee.	19	Boston Med. and Surg. Jour., 1882, cvi, 289	Papilloma.	Finger and finger nail.	"	Recovery.	
34 1881	Hill.	40	London Lancet, 1881, 2, 10, 3.	Polyp	?	"	Recovery.	
35 1881	Thorne.	28	London Lancet, 1883, 1, 58.	Fibrous papilloma.	Scissors.	"	Recovery.	Tumor dragged through meatus.
36 1882	Ker.	40	Br. Med. Jour., 1885, 2, 287.	Carcinoma	Ecraseur.	"	Improved.	A second operation 3 years later; recovery.
37 1882	Whitehead.	58	London Lancet, 1883, 2, 582, 629, 673.	Sarcoma	Volkman's spoon.	"	Improved; (recovery.)	Second operation at end of 6 months. After another 6 months, no recurrence.
38 1882	Stroisiski.	45	Chicago Med. Jour., 1882, xlv, 478.	Polyp.	Tumor twisted off.	"	Recovery.	Laceration of bladder wall so that injected warm water entered abdominal cavity. Suture of bladder inserted through meatus.
39 1882	Sir H. Thompson.	30	Surg. of Urin. Organs, London, 1884, 72.	Fibro-papilloma.	Removed with forceps.	"	Recovery.	Two operations.
40 1883	"	65	Surg. of Urin. Organs, London, 1884, 72.	Papilloma.	Removed with forceps.	"	Death.	In 3 days of suppression of urine.
41 1883	Whitehead.	32	London Lancet, 1883, 2, 582, 629, 673.	"	Curette.	"	Recovery.	

42	1883	Winckel.	156	Arch. f. Gynæk., 1884, xxiv, 69.	Carcinoma.	Sharp spoon.	Per urethram.	Death.	Recurrence, twice operated upon. Death from exhaustion after fifteen days.
43	1883	Kaltenback.	44	Arch. f. Klin. Chir., 1884, xxx, 699.	Adenoma of mucous glands.	Ligature, knife, scissors and thermocautery. Forceps.	Colpocystostomy	Recovery.	
44	1883	Lawson Tait.		Diseases of Women and Abdominal Surg., 1889, Vol. I.	Papilloma.		Per urethram,	"	
45	1883	Spencer Wells.		London Lan., 1883, I, 145.	Polyp.	?	"	"	
46	1883	"		"	"	?	"	"	
47	1884	Guyon.	44	Leçons Clin. d. Vessie, Paris, 1888.	Papilloma.	Scraping.	"	Improved.	Died in 2 months.
48	1884	Sonnenburg.	21	London Lan., 1888, I, 764.	"	Scraped with fingernail and supra pubic. Tumor extirpated with part of bladder wall.	"	"	
49	1884	"	60	Ber. kl. Wch., 1884, p. 834.	Fibro-sarcoma.		"	Recovery.	Reported after 3 months.
50	1884	Tiffany.	27	Maryland Med. Journal, Jan. 10, 1885.	Papilloma.	Scraping.	"	"	
51	1885	Guyon.	60	Op. cit.	?	"	"	Improved.	Died 4 months later.
52	1885	"	50	"	Cancer.	"	"	"	
53	1885	Mikulicz.	60	Wien. Med. Pr., 1885, —, 1887.	Carcinoma.	Sharp spoon.	"	"	Recurrence in 3 months.
54	1885	V. Antal.	48	Wien. Med. Woch., 1885, xxxv, 1177.	Papilloma.	Ligature and scissors.	Supra pubic.	Recovery.	Suture of bladder and abdominal wounds.
55	1885	Grünfeld.	30	Wien. Med. Pr., 1885, xxvi, 1189.	"	Wire loop.	Per urethram.	"	Endoscope used.
56	1886	Kümmel.	42	Deutsch. Med. Woch., 1887, xiii, 123.	"	Tumor excised.	Colpocystostomy	"	Suture of mucous membrane with cat-gut.
57	1886	Mundé.	42	Am. Jour. Obst., 1886, xix, 267.	Epithelioma.	Finger nail and scoop.	Per urethram.	Improved.	

TABLE I —CONTINUED.

No. Date.	Operator.	Age	Where Reported.	Kind of Tumor.	Method of Removing Tumor.	Method of Encircling Bladder.	Result.	Remarks
58	1886 Kiister.	45	Volkman's Sam. Klin. Vort., 1886, No. 84.	finbri- Papilloma ated.	Tumor excised.	Supra pubic.	Recovery.	Suture of wound of excision, also of bladder.
59	1886 J. Greig Smith.		Br. Med. Jr., 1886, 1, 1161.	Papilloma.		Per urethram.	"	
60	1886 "		" "	Epithelioma.	Thompson's forceps.	Incision of urethra.	Improved.	
61	1886 "		" "	Papilloma.	Finger nail.	Dilatation and incision of urethra.	Recovery.	
62	1886 Croft.		Med. Press, 1886, 2, 475.	"		Per urethram.	"	
63	1886 Bryant.	35 ?	" "	"		"	"	
64	1886 Guyon.	45	Op. cit.	Myxoma.	Scraped.	"	"	
65	1888 Sydney Jones.	58	London Lat., 1887, 2, 65.	Papilloma.	Wire ecraseur.	"	"	
66	1883 Gibbons & Parker.	18	Tr. Clin. Soc., xxi, 58.	Myoma.	Galvano ecraseur.	"	"	Suprapubic wound of bladder sutured.
67	1888 Van Der Veer.	45	Med. News Phila., 1888, liii, 235.	Papilloma.	Curette.	Per urethram & supra pubic.	Improved.	Tumor incrusted.
68	1888 Golding-Bird.	55	Br. Med. Jr., Jan. 5, 1889.		Galvano-caustic loop.	"	Death.	On 5th day.

TABLE II.—PUBLISHED OPERATIONS FOR TUMORS OF THE BLADDER OCCURRING IN MEN.

No. Date	Operator.	Age	Where Reported.	Kind of Tumor.	Method of Removing Tumor.	Method of Entering Bladder.	Result.	Remarks.
1 1839	Covillard.		Le Chirurgien Operateur, Lyons, 1040.	?	Crushed and removed with forceps. With his trilabe.	Lateral perineal	Recovery.	From Thompson. "Tumors of the bladder."
2 1837 et. seq.	Civiale.		Traite pratique, t. 3, 152-161.	?	"	Per urethram.	"	Small tumor.
3 1827 et. seq.	"		Traite pratique, t. 3, 152-161.	?	"	"	"	"
4 1827 et. seq.	"		Traite pratique, t. 3, 152-161.	?	"	"	"	"
5 1827 et. seq.	"		Traite pratique, t. 3, 152-161.	?	"	"	Failure.	Large tumor.
6 1830	Desault.		Dict. d. Scien. Med. xlv, 233.	Polyp.	Twisted off with forceps.	Lateral perineal	Recovery.	Tumor found while operating for stone.
7 1834	Crosse.	Boy	Treatise on Calculus, Lond., 1835, 124.	"	Some of the tumors cut off.	"	Death.	Tumors protruded into wound Death in 44 hours from exhaustion.
8 1834	Civiale.		Op. cit.	?	With his trilabe.	Per urethram.	Good.	Small tumors, Hop. Necker.
9 1862	Liston.	?	Med. Tim. and Gaz., 1862, 104.	Membranous cyst.	Removal with fingers.	Supra pubic.	Recovery.	Death from disease of kidney. Reported by Knox.
10 1874	Billroth.	12	Arch. f. Klin. Chir., xviii, 411.	Myoma.	Torn off with fingers; pedicle ligated & excised.	Lateral perineal & supra pubic.	"	Through drainage practised.
11 1874	Volkmann.	54	Arch. f. Klin. Chir., xix, 682.	"	Torn off with fingers; pedicle torn through with finger nail.	Median perineal & supra pubic.	Death.	On 4th day from peritonitis and urinary infiltration. Two more tumors found post-mortem.
12 1874	Kocher.	38	Centralbl. f. Chir., April, 1876.	Papilloma.	Caught in eye of catheter.	Nelaton's pre-rectal cystotomy.	Recovery.	
13 1875	Maas.	53	Berl. Klin. Woch., 1876, 48.	Polyp.		Per urethram.	"	

TABLE II.—CONTINUED.

No. Date.	Operator.	Age	Where Reported.	Kind of Tumor.	Method of Removing Tumor.	Method of Entering Bladder.	Result.	Remarks.
14 1875	Maas.	33	Berl. Klin. Woch., 1876, 48.	Polyp.	Caught in eye of catheter.	Per urethram.	Recovery.	Two small tumors removed.
15 1876	"	38	"	"	Caught in eye of catheter.	"	"	Small tumor with long slender pedicle.
16 1877	Humphrey.	21	Med. Chir. Trans., lxii, 421; Brit. Med. Jour., 1879, 1, 854.	Firm tumor with ragged surface.	Pedicle torn through with finger nail and forceps.	Lateral perineal	"	
17 1880	Davies Colley.	32	Clin. Soc. Trans., xiv, 104.	Villous tumor.	Long pedicle cut with scissors.	"	"	Alive and well in 1884.
18 1880	Berkley Hill.	63	Brit. Med. Jour., May 14, 1881.	Epithelioma.	Scraped.	"	Death.	On 3rd day of exhaustion. Tumor only partially removed.
19 1880	Marcacci.	54	Lo Sperimentale, Oct., 1880.	Spindle-cell sarcoma.	With fingers.	Supra pubic.	"	Lived two months. Died of peritonitis.
20 1880	Ransohoff.	26	Phila. Med. News, xlii, 153.	Papilloma.	Sharp spoon.	Lateral perineal	Recovery.	
21 1880	Rauschenbusch.	43	Centbl. f. Chir., Jan. 6, 1883.	Polyp.	Twisted off.	Median perineal	"	
22 1881	Czerny.	52	Deuts. Med. Woch., 1885, xi, 464.	Sarcoma.	Scissors and thermocautery.	Supra pubic.	Death.	In 3½ months of recurrence and exhaustion.
23 1882	Morgan.	65	London. Lancet, 1882, 2, 439.	Papilloma.	Lithotrite.	Median perineal	Improved.	
24 1882	Czerny.	55	Deuts. Med. Woch., 1885, xi, 464.	Sarcoma.	Sharp spoon.	Supra pubic.	Death.	Peritonitis from perforating ulcer of stomach. Abscess between pubes and bladder.
25 1882	Trendelenberg.	35	Arch. f. Klin. Chir., 1885, xxxi, 494.	Papilloma. ?	Scissors and sharp spoon.	"	"	Death in 3 months of pyonephritis. Reported by Willy Meyer.
26 1882	Bazy.	47	Ann. d. Mal. des Org. Gen. Urin., Sep. and Oct., 1883.	Epithelioma.	Snare.	"	"	Died after 6 months.
27 1882	Whitehead.	70	London. Lancet, 1883, 2, 582, 629, 673.	Papilloma.	Sharp spoon.	Median perineal	Recovery.	
28 1882	"	57	London. Lancet, 1883, 2, 582, 629, 673.	Epithelioma.	Finger nail.	"	Improved.	Died 3 months later of uræmia. (?)

29	1882	Whitehead.	33	London, Lancet, 1883, 2, 582, 629, 673.	Papilloma.	Growth scraped away.	Median perineal	Death.	Growth situated at fundus. Death due to exhaustion in 3 months.
30	1882	Sir H. Thompson.	46	Surg. of Urin. Organs, London, 1884, p. 75.	Transitional type.	Removed with forceps.	"	"	In few days Tumor large. Hemorrhage severe. No autopsy.
31	1882	"	52	Surg. of Urin. Organs, London, 1884, p. 72.	Papilloma. ?	Removed with forceps.	"	Improved.	Two subsequent operations in 1883 and 1884.
32	1883	Whitehead.	63	London, Lancet, 1883, 2, 582, 629, 673.	" ?	Curette.	"	Recovery.	
33	1883	Bontecou.	28	Tr. Am. Surg. Ass., Vol. 1, 505.	"	Finger nail.	"	"	
34	1883	"	26	Tr. Am. Surg. Ass., Vol. 1, 505.	"	Forceps and finger nail.	"	"	
35	1883	Sir H. Thompson.	67	Surg. of Urin. Organs, London, 1884, p. 72.	"	Removed with forceps.	"	Improved.	Probable recurrence and subsequent death.
36	1883	"	67	"	Epithelioma.	Removed with forceps.	"	"	Died in 6-7 months.
37	1883	"	63	"	Papilloma.	Removed with forceps.	"	Recovery.	
38	1883	"	64	"	" ?	Removed with forceps.	"	Improved.	Died in 2 months with secondary malignant growth on thigh.
39	1883	"	53	"	"	Removed with forceps.	"	Death.	Four days after operation. Cause of death not given.
40	1883	"	65	"	Fibro-papilloma.	Removed with forceps.	"	"	In 2 weeks of exhaustion.
41	1883	"	56	"	Transitional type.	Removed with forceps.	"	Improved.	Living in 1884. Incomplete removal.
42	1883	"	52	"	Probably malignant	Removed with forceps.	"	Death.	Much bleeding up to 2d day. Died on 12th day of exhaustion.
43	1883	"	57	"	Myoma.	Removed with forceps.	"	Improved.	Recurrence in 10 months.
44	1883	"	40	"	Fibro-papilloma.	Removed with forceps.	"	Recovery.	
45	1883	"	42	"	Transitory papilloma.	Removed with forceps.	"	"	
46	1883	Trendelenberg.	37	Arch. f. Klin. Chir., 1885, xxxi, 494.	Cancer.	Scissors & sharp spoon.	Supra pubic.	Death.	

TABLE II.—CONTINUED.

No. Date.	Operator.	Age.	Where Reported.	Kind of Tumor.	Method of Removing Tumor.	Method of Entering Bladder.	Result.	Remarks.
47 1883	Guyon.	59	Lecons Clin. de la Vessie, Paris, 1888.	?	Scraped out.	Supra pubic.	Death.	Of heart failure on 5th day.
48 1883	W. Anderson.	53	Tr. Clin. Soc., London, 1885, xviii, 313.	Papilloma.	Torn off with forceps.	Median perineal	Recovery.	See case No. 115.
49 1884	Todlee.	49	Med. Times and Gazette, 1884, 2, 433.	Epithelioma.	Thompson's bladder forceps.	"	"	Reported 1 month after operation.
50 1884	Little.	49	Phil. Med. News, 1884, xiv, 550.	Papilloma.	Thompson's bladder forceps.	"	"	Over twenty tumors removed.
51 1884	Watson.	60	Boston Med. and Surg. Jour., 1884, cxi, 409.	Probably cancer.	Curette.	"	Death.	Tumor sessile. Death in 2½ months from exhaustion.
52 1884	Reginald Harrison.	42	London Lan., 1884, 2, 678.	Villous tumor.	Forceps and curette.	"	"	Death in 12 hours of syncope.
53 1884	Bernard Pitts.	43	Clin. Soc. Trans., 1885, xviii, 320.	Papilloma.	Forceps and exciseur.	"	Improved	
54 1884	Barton.	36	Phil. Med. Times, 1884, xv, 905.	"	Sharp spoon.	Lateral perineal	Recovery.	
55 1884	Guyon.	68	Op. cit.	Fungus.	Spoon & finger.	Supra pubic.	Death.	In 5 days of exhaustion.
56 1884	"	52	"	Cancer.	Scraped with spoon.	"	Improved.	Relapse in 3 months. Died in 4 months.
57 1884	Henry Morris.	47	London. Lancet, 1884, 1, 751.	Papilloma.	Cat-gut ligature	Median perineal	Recovery.	Operated upon 2 years before for prostatic calculus.
58 1884	Sir H. Thompson.	50	Surg. of Urinary Organs, London, 1884, p. 72.	"	Removed with forceps.	"	"	
59 1884	"	69	"	Fibro-papilloma.	"	"	Death.	In 3 weeks of exhaustion.
60 1884	"	58	"	Transitional type.	"	"	Improved.	Partial Removal.
61 1884	"	63	"	Papilloma.	"	"	Recovery.	Death from amputation of arm in 1885. At autopsy bladder healthy, site of tumor shown by small cicatrix. London Lancet, 1886, 1, 239.

62	1884	Roddick.	53	Canada Med. Jour., Feb., 1885.	Papilloma.	Removed with finger nail.	Median perineal.	Recovery.	
63	1884	Tiffany.	?	Mayland Med. Journal, Jan. 10, 1885.	"	"	"	"	Recurrence within 4 months.
64	1885	Guyon.	59	Op cit.	"	Sharp spoon. Base cauterized.	Supra pubic.	"	
65	1885	"	65	"	"	Forceps.	Median perineal.	Death	
66	1885	"	63	"	"	Scraped. Base cauterized.	Supra pubic.	Recovery.	In 3 days of exhaustion.
67	1885	"	38	"	"	Forceps. Base cauterized.	"	"	
68	1885	"	59	"	Polyp.	Galvanic loop.	"	"	
69	1885	"	44	"	"	Ecraseur and thermocautery.	"	"	
70	1885	Hofmoeckl.	66	Med. Jahrb. Wien., 1885, xv, 257. Med. Chir., Centbl. Wien., 1886, xxi, 579.	Papilloma.	Forceps.	Median perineal.	Death.	From Duodenal hemorrhage.
71	1885	E. Desnos.	43	Cong. Franc. d. Chir., 1886, 2, 604.	"	Curette.	Supra pubic.	Recovery.	
72	1885	Mikulicz.	57	Wien. Med. Presse, 1885, 1, 326.	"	Finger & sharp spoon.	Median perineal.	"	
73	1885	Langton.	25	Lond. Lan., 1885, 2, 1185.	Alveolar Sarcoma.	Finger & scoop.	"	"	Report 1 month after operation.
74	1885	v. Dittel.	62	Wien. Med. Woch., 1885, 233.	Papilloma.	Ligature and scissors.	Supra pubic.	"	Catheter a demeure and supra-pubic elbowed glass drainage tube.
75		"	51	"	"	Ecraseur and sharp spoon.	"	"	
76	1885	Reg. Harrison.	56	London Lancet, 1885, 2, 14.	"	Forceps, scoop and finger.	Median perineal.	Death.	On 18th day of pyelitis.
77	1885	Conner	58		Epithelioma.	Sharp spoon.	"	"	Four weeks later of exhaustion.
78	1885	V. Antal.	61	Wien. Med. Woch., 1885, xxxv, 1212.	"	Resected upper 1/3 of bladder.	Supra pubic.	Recovery.	Sutures. Through drainage.
79	1885	Czerny.	66	Deut. Med. Woch., 1885, xi, 464.	Carcinoma.	Resected upper 1/2 of bladder.	"	Death.	In 2 months from recurrence, exhaustion and suppurating kidneys.

TABLE II.—CONTINUED.

No. Date.	Operator.	Age	Where Reported.	Kind of Tumor.	Method of Removing Tumor.	Method of Re-sterilizing Bladder.	Result.	Remarks.
80 1886	Lange.	64	N. Y. Med. Jour., xlvii, 79.	Papilloma.	Scissors & thermocautery.	Supra pubic.	Recovery.	
81 1886	Bernard Pitts.	47	Med. Pr. und Circ., 1886, xlii, 475.	"	Scissors and sharp spoon.	"	"	See case No. 53. operated upon twice at intervals of 2 years.
82 1886	V. Bergmann.	50	Lon. Lancet, 1888, 1, 764.	"		"	"	Reported by Nitze. Cystoscopic diagnosis.
83 1886	H. Kummel.	31	Deut. Med. Woch., 1887, xlii, 123.	"	Base of pedicle excised and wound so made sutured.	"	"	Supra-pubic wound closed with 3 rows of cat-gut sutures.
84 1886	Marriott.	63	Brit. Med. Jour., 1887, 1, 1094.	Cancer.	Thompson's forceps.	Median perineal.	Death.	Reported by J. H. Neale. Death due to exhaustion after 3 months.
85 1886	Guyon.	60	Op. cit.	Epithelioma.	Scraped and cauterized.	Supra pubic.	"	On 4th day probably of pelvic cellulitis. Recurrence of case 67.
86 1886	"	64	"	"	Scraped and cauterized.	"	Improved.	
87 1886	"	48	"	"	Ecraseur and scraping.	"	"	Died of recurrence in 7 months
88 1886	"	56	"	Carcinoma.	Scraped and cauterized.	"	Death.	Of peritonitis in few days. Attempted resection.
89 1886	"	64	"	"	Scraped and cauterized.	"	Improved.	Died in less than 4 months.
90 1886	"	53	"	Epithelioma.	Dissected out.	"	"	Wound edges sutured with 5 cat-gut stitches.
91 1886	"	43	"	"	Enucleated.	"	"	
92 1886	C. B. Browne.	64	Brit. Med. Jour., 1887, 1, 204.	Fibro-papilloma.	Twisted off with forceps.	Supra pubic and median perineal.	Recovery.	
93 1886	D. Hayes Agnew.	45	Jour. Am. Med. Assn., 1886, vi, 160.	Papilloma.	Thompson's forceps.	Perineal.	"	Reported by Yarrow.
94 1886	Hulke & Morris.	57	Med. Pr. und Circ., xlii, p. 45.	"	Twisted off with forceps.	Median perineal.	"	Death in 3 months from phthisis.
95 1886	"	64	"	"	Twisted off.	"	Death.	Acute pyonephritis.

96	1886	Hulke & Morris.	47	Med. Pr. and Circ., xlii, Papilloma, p. 66.		Base ligated with cat-gut.	Twice operated upon.
97	1886	"	63	"	"	Twisted off.	Death.
98	1886	"	59	"	"	Growth freely removed.	Recovery.
99	1886	J. Greig Smith.		Br. Med. Jour., 1886, i, Malignant, 1161.		Tumor scraped.	Improved.
100	1886	Morant Baker.	55	London Lan., 1886, i, 737.	Sarcoma	Thompson's Median perineal forceps.	"
101	1886	Herteloup.	53	Prog Med., 1886, iv, 773.	Papilloma.	Sponaneous expulsion	Recovery.
102	1886	Bryant.		Boy Med. Press, 1886, 2, 475.	Papilloma.	Caught in eye of Perurethram.	"
103	1886	"		"	"	Forceps and Median perineal spoon.	"
104	1886	Morris.		"	Large, hard and nodulated.	Tumor broken & supra pubic.	"
105	1886	Sir H. Thompson.	44	Br. Med. Jour., 1887, i, 1264.	"	Finger nail and Perineal & supra pubic.	"
106	1887	Sydney Jones.	54	London Lan., 1887, 2, 65.	Papilloma.	Wire curaseur.	"
107	1887	Sir H. Thompson.	55	Tr. Path. Soc., London, xxxviii, 183; Tr. Clin Soc., London, 1887.	Chondro sarcoma.	Removed with Median perineal forceps.	"
108	1887	"	62	Br. Med. Jour., 1887, i, 1264.	Papilloma.	Finger nail and scoop.	"
109	1887	Holcomb.	26	Weekly Med. Review, i, xvii, 93.	"	Cut off with scissors. Base cut-retted.	Report 3 months after operation.
110	1887	Madelung.	55	Lon. Lancet, 1888, i, 764.	"	?	Reported by Nitze.
111	1887	V. Pergmann.	60	"	Carcinoma.	?	Death from recurrence. Report by Nitze.
112	1887	"		"	Papilloma.	?	Recovery.
113	1887	Nitze.	67	"	"	?	Death from recurrence. Cases reported by Nitze, seen with cystoscope.

TABLE II.—CONTINUED.

No. Date	Operator.	Age	Where Reported.	Kind of Tumor.	Method of Removing Tumor.	Method of Extirpating Bladder.	Result.	Remarks.
114	1885 Watson.	31	Boston Med. and Surg. Jour., cxvii, 1887, 421.	Papilloma.	Finger nail and curette	Supra pubic.	Recovery.	Supra pubic wound closed with suture. Perineal drainage and catheter a demeur.
115	1887 Guyon.	55	Op. cit.	Epithelioma.	Excision and scraping.	"	Improved.	
116	1887 "	58	"	"	Excision and scraping.	"	"	
117	1887		Lond. Lancet, 1888, 1, 764.	Carcinoma. ?	"	"	"	
118	1888 Israel.	7	Tr. Clin. Soc., London, xxii, 278.	"	Forn off with forceps.	"	Death.	Death in 7 months from recurrence in supra-pubic wound. See case No. 54 same case. Operated upon twice. At 2nd operation situation of 1st tumor shown by cicatrix. At same time a prostatic tumor removed. On 18 day of exhaustion. No peritonitis.
119	1888 W. Anderson.	46	Br. Med. Jour., 1888, 1, 116.	Papilloma.	?	"	"	
120	1888 Hueston.	67	Br. Med. Jour., 1888, 1, 14.	Fimbriated papilloma.	With scoop.	"	Recovery.	
121	1888 G. Barling.	61	"	Carcinoma.	Finger & scoop.	"	Death.	From exhaustion on 4th day Partial removal.
122	1888 Marcy.	64	Boston Med. and Surg. Jour., April 18, 1889.	Villous tumor.	Ligated.	"	Recovery.	
123	1888 F. A. Southam.	50	Lond. Lan., 1888, 1, 1023.	Papilloma.	?	Supra pubic and perineal.	"	
124	1888 F. N. Otis.	23	N. Y. Med. Rec., 1888, 493.	"	Scissors & thermo-cautery.	Supra pubic.	"	
125	1888 Barlenheuer.		Arch. f. Path. Anat., cxii, 468.	"	Scissors.	Median and supra pubic.	"	Two operations, 8 days interval.
126	1888 Ward.	44	Lond. Lancet, 1888, 2, 421.	Villous tumor.	Twisted off. Pedicle cut close with scissors	Supra pubic.	"	Pedicle long and slender.
127	1888 Watson.	37	Boston Med. and Surg. Jour., 1888, cxix, 145.	Papilloma.	Forceps and curette.	Median perineal	"	Recurrence in 1 year.

ON LUMBAR HERNIA.¹

BY CLAUDIUS H. MASTIN, M.D.,

OF MOBILE, ALA.

A CONTRIBUTION to the literature of any pathological rarity is worthy of permanent record; and since cases of lumbar hernia are of extreme rarity, I feel justified in offering the history of a case which came under my observation at birth—congenital in the true acceptance of the term—and has been kept under notice for the last six years.

This child, Geo. H. Liversage, was born March 12, 1884, at the little town of Whistler, a small village some six miles from the city of Mobile, and is, consequently, six years of age. His father and mother are both healthy, strong young people, and this boy is their fourth born. The mother's labor was normal, and, with the exception of this hernial protrusion, the child is healthy and well formed. When about two months of age the child was brought to my office seeking an opinion and treatment; the grandmother informing me that there was "a large wen" on the child's left side, and they wished something done for its removal.

I at once recognized the nature of the protrusion, counseled against any operative proceedings, but advised the use of a supporting bandage. At my request the mother consented to have the case photographed, the illustrations of which are herewith presented.

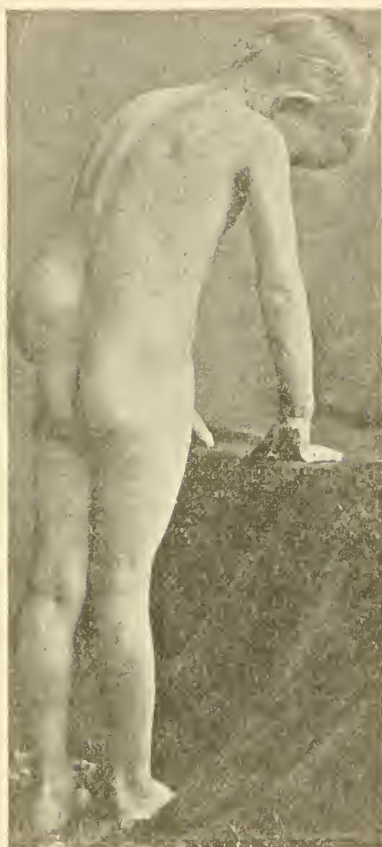
The only treatment possible—a supporting bandage—was applied, but the inconvenience of constantly readjusting it caused the mother to neglect its use, and the child was left with no other support than that afforded by the usual diaper, which in this instance was made to swaddle the infant higher

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upon the back, and more up upon the sides than it is usually applied.

After a year the parents left Alabama and went to reside in Texas, where they remained until about eighteen months or two years ago, when they returned to Whistler, and since that date I have had an opportunity, from time to time, of seeing and examining the case. He is now a well-grown, healthy boy of six years of age, and, although wearing no support, he suffers not the least inconvenience whatever from the protrusion, which now measures $9\frac{1}{2}$ inches in its long axis, with a transverse diameter of 9 inches. To the sense of touch, the contents of the hernial sac appear to be the descending colon with a large mass of small intestines. I am not able to decide whether any omentum is present or not, although the hernial mass appears to be just beneath the skin and transversalis fascia, with no intervening muscular structure. So far as I can determine from an ante-mortem examination, the latissimus dorsi and quadratus muscles, at this locality, are wanting, or, if present, are only in rudimentary form. The outer edge of the hernial opening is close against the transverse processes of the lumbar vertebræ, and only separated from them by a small band of muscular tissue, which is, most likely, the erector spinæ, since I cannot detect any trace of the quadratus or latissimus dorsi. I know of nothing else which it could be. The inner side is bounded by the oblique, but I am unable to make out a defined edge of that muscle since the whole abdominal wall on the left side appears thinned and weakened; the crest of the ilium supports the lower margin of the protrusion. As will be noticed in the illustrations, there is a distinct *direct* inguinal hernia of the left side, but none on the right. For the past four years there has been no support used, and the child not restrained in any of its actions; he romps, climbs, moves around and plays as other boys of his age are accustomed to do, and has no inconvenience whatever from his deformity. He is a very bright boy, and, to all appearances, in the enjoyment of perfect health.

His mother informs me that about two hours after a full meal, and especially so if he has partaken freely of soup or other fluids, the hernia enlarges greatly and becomes tense.



DR. MASTIN'S CASE OF LUMBAR HERNIA AT SIX YEARS OF AGE.

FIG. 1. BACK VIEW.



FIG. 2. SIDE VIEW.

then the little fellow kneads it up with his hands, when it soon subsides and assumes its natural shape, size and appearance, as shown in the illustration. This increase and subsidence in

shape and size after a meal would indicate that the bulk of the hernial contents is composed of small intestines.

For a great many years lumbar hernia has been known occasionally to take place, but the instances have been so very rare, that it may be properly considered as one of the anomalies of intestinal protrusion; and so rare is it that very few of the concise treatises on surgery make any mention whatsoever of the subject. I know no author who has written a special work upon hernia who has made even an allusion to its possible occurrence. Neither Sir Astley Cooper nor Mr. Lawrence (whose works on hernia are the standard authorities) have made any reference to the anatomical weakness of the loin as liable to give exit to a hernial protrusion, nor do they speak of the possibility of any such occurrence taking place.

That small triangular space bounded by the crest of the ilium, the margins of the external oblique, and latissimus dorsi muscles, known to anatomists as the "triangle of Petit," is a comparatively weak spot in the abdominal wall, through which a hernial protrusion *may take place*, but the anatomical relations are such that strangulation is very improbable. In fact, among the total number, 33 in all, of the cases of lumbar hernia which I have been able to collect, after a long and painstaking research, I find only three cases in which anything like true strangulation has taken place; and in two of these an operation was resorted to for their relief; one of them recovered after a lingering illness, the other died. One of the three—(case 3 in the abstract), that of Raverton, was operated upon in 1738, the other, Dr. G. H. Hume's case (32 in the abstract), was done in 1889. The case of Mr. Owen (22 in the abstract) was operated on with the intention of performing a radical cure; for neither strangulation nor obstruction existed at the time of the operation.

Notwithstanding the weakness of that portion of the abdominal wall—the space designated as "Petit's triangle"—we have been unable to find any evidence going to prove that the presence of this triangle exerts any influence whatever in the development of the hernial protrusion. With the single exception of case 31, that of Mr. Hutchinson, no post-mortem examination has been made of any one of the recorded cases,

with the intention of discovering the direct route through which the protrusion had passed; and it was discovered in his case that the hernia, although appearing to come through the triangle, in reality passed above the triangle, outside of the quadratus lumborum, and through the transversalis and latissimus dorsi muscles, at that point where the latter comes from the fascia covering the erector spinæ muscle.

An interesting feature shown at the autopsy of Mr. Hutchinson's case, was the absence of any peritoneal sac. The looseness of the attachments of the peritoneum in this region is well known, and is taken advantage of in certain operations, such for instance as the removal of the kidney through a lateral incision. So in this case it was quite easy to make the peritoneum, by gentle pressure, protrude into the hernial opening; and as it is quite certain that it had habitually during life contained intestine, it is obvious that every time the latter was reduced the peritoneal sac must have returned with it into the abdominal cavity. Whether this feature has been present in other cases of lumbar hernia it is impossible to decide, but if so, it is one rarely met with in connection with the more common varieties of hernia.

As to the portion of the intestine usually contained in a lumbar hernia, it is a very difficult matter to decide in the absence of a post-mortem examination, and such examinations have not been made in a sufficient number of instances to enable us to establish a rule by which we can say positively what is the contents of any given case.

The colon, from its relation to the parts both on the right and the left, is the viscus most liable to escape through the opening, but the case of Raverton proves that the small intestines are also found to be in the hernia; and Baron Larrey's case showed a mass of omentum forming a part of its contents.

The coverings of a lumbar hernia are irregular, and no evidence exists to prove that there is any uniformity in the investing tissues, for it depends entirely upon the way in which the protrusion takes place, it not being certain that it escapes through the triangle of Petit. From the fact that Petit's name and triangle have been so long associated with this form of hernia, the idea is prevalent that its place of exit is through

this weakened place in the abdominal wall, and that to Petit is due the credit of having first described this form of hernia; this is, however, an error, for Barbetta, in 1650, mentioned this variety of rupture, and Garengot, in 1731, Raverton, in 1750, together with Lachauss, in 1759, all described it, long before Petit published his case in 1783. The case of Mr. Edmund Owen (case 23) did, according to his statement, pass through the triangle; but the cases of Hutchinson and Braun, where an opportunity was had to inspect the exact locality of the hernia, it was found that neither one passed through that opening, and in reality in Mr. Braun's case the triangle did not even exist! In the case of Dr. Hume, although no post-mortem was permitted, he observed at the time of his operation for strangulation that "the sac communicated with the general peritoneum by a small slit-like opening, and across the neck there were stretched two tense cords which were the agents in producing strangulation." He says "the rupture did not appear to have protruded through the triangle of Petit, as is stated to be the rule in cases of lumbar hernia." In my own case the hernia has not passed through the triangle, because it is very evident that the muscles which go to form that triangle are, to a great degree, wanting, and consequently no defined triangle can exist. Besides these facts, according to the observations of Lesschaft, the triangle of Petit is nearly always wanting in children, and absent in about every fourth adult.

As to the causes which have produced this variety of hernia, I find, after a careful analysis of the 33 cases which I have collected and tabulated, only one can be considered of spontaneous origin; 27 of them were in adults or elderly persons; 6 were in children, 3 of which were congenital; 17 were in males; 15 in females; 20 were on the left side, 10 on the right, 1 on both sides, and 2 the side not mentioned; 4 followed the track of an abscess, and that the abscess itself had probably, in finding its way to the surface followed the course of a nerve, which was most likely the lowest posterior lumbar branch; to 11 of these cases no cause was attributed; 2 cases resulted from carries and necrosis; 1 was due to old age and prolonged child-bearing; 11 caused by strains, wounds or severe injuries. The spontaneous case was in an adult, whilst those due to abscess

were in younger persons. To account for the three congenital cases is not possible, since there is nothing in the development of the abdominal wall to account for the formation of a gap in the lumbar region.

Owing to the frequency of confounding lumbar hernia with abscess, it is important that a clear diagnosis should be made. The absence of fluctuation, the resonance and reducibility of a tumor in the lumbar region should serve as an important guide. The knowledge that such a hernia is possible should place the surgeon on the alert in all cases where he is in the least doubt as to the true nature of an enlargement in the region of the loin. The case which came under the care of Prof. Dolbeau is an instance of this necessity, for being mistaken for an abscess, the intestine was incised and a fœcal fistula resulted. The diseases most likely to be confounded with this hernia, are hernia of the muscle itself, sarcomata, hæmatoma, perinephritic abscess, hydronephrosis and carcinomatous tumors of the kidney. By a careful exclusion of first one and then another, we may arrive at a correct diagnosis. Whilst hydronephrosis bulges at the same place, it is painless, has no resonance and is not reducible; a perinephritic abscess is always sensitive, and productive of a high range of temperature; whilst on the other hand, carcinomatous tumors are not, as a rule, attended with febrile symptoms, becomes a fact which will throw light in differentiating them from perinephritic and other abscesses; they are not so liable to be taken for this hernia, since their history and course will measurably exclude them; sarcoma and hæmatoma are infrequent in this region, and a careful inspection will draw a line of distinction between them and lumbar hernia.

The treatment is little more than protecting the protrusion from injury by a well constructed pad and abdominal belt. Should strangulation take place a necessity arises as in the cases of Raverton and Hume, and the operation of herniotomy should be performed. In those cases where the opening through which the hernia passes is small and defined, and symptoms of obstruction or strangulation become present, then the case of Mr. Owen suggests the propriety of a resort to a radical operation.

To those who may be interested in the history and literature of this subject, I believe the annexed abstract of cases, together with the bibliography attached, will be found to comprise all, or a least very nearly all, which, to this date, has been written upon the subject of lumbar hernia.

ABSTRACT OF CASES.

CASE 1. A female, æt. 30 years, 3" from anterior superior spine apparently through Petit's triangle, 8 cm. in diameter, containing intestine only, easily reducible, appeared during straining effort. A similar triangular aperture could be made out on the other side—side not stated.—Hardy: *Bull de l'Acad. de Med.*, vol. 34, p. 124.

CASE 2. A female, age not stated, in making a false step felt sudden pain in right loin, then vomiting came on from which patient died. Garengot, after death, found a tumor "the size of a nut" which suddenly disappeared with gurgling sound during taxis.—Garengot: *Traite des operations*, 1731.

CASE 3. A female, middle age. After vomiting for three weeks, a tumor appeared in the left side. Raverton operated for strangulation, let out some pus, then ligatured a mass of inflamed omentum and returned 3 coils of small intestine. The woman was pregnant at the time, and some days after the operation the intestines came out again at each dressing. The patient made a lingering, but complete recovery, and gave birth to a living child.—Raverton: *Traite des plaies armes à feu*, 1750.

CASE 4. A middle aged man, with other hernial protrusions, also had a lumbar hernia in both the right and left sides, but no full particulars are given.—Lachausse, 1759.

CASE 5. A female, middle age, pregnant, developed lumbar hernia, on the left side, about the size of a child's head; it was usually reducible but became strangulated, and was *perhaps* operated on, but unfortunately no details are given as to this point.—I. L. Petit: *Traite des maladies Chir.*, tome ii, 1783.

CASE 6. A man, 65 years of age, had a lumbar hernia of the right side to appear suddenly after a strain or violent exertion. It was subsequently reducible, but symptoms of strangulation developed a few months later, which, when the patient lay prone reduction could be affected, and a truss would keep the hernia back.—Cloquet: *These sur les hernies*, 1819.

CASE 7. A female, whose age is not given, after a fall complained

of severe lumbar pains, and was long treated for "pleurisy." Some 36 years later an abscess developed in the loin and a loop of intestine was exposed. After a while the site of the abscess healed, but no mention is made as to the effect upon the hernia.—Van Huegel: *Gaz. de Hopitaux*, 1848.

CASE 8. A female child, about one year. of age, was found with a left lumbar hernia of small size, which was easily reduced.—Colles: *Dublin Journal*, May, 1857.

CASE 9. A middle aged man, after a severe blow on the loin, developed a lumbar hernia of the left side, which was about the size of the fist, and was easily reduced. It was cured by the constant use of a belt truss. At first it gave rise to many errors of diagnosis.—Nelaton: *Verbal Communication to Baron Larrey*.

CASE 10. A middle aged man, a similar case to the last, had a right lumbar hernia appear some length of time after a like injury.—Chaplain: *Bull. de la Soc. de Med. de Marseille*.

CASE 11. A female, forty years of age, had a lumbar hernia of the left side which was as large as a foetal head at term. It was, apparently, a fatty hernia in its origin, but contained intestine and the skin was tightly stretched over it.—Marmisse: *Gaz. des Hopitaux*, 1862.

CASE 12. A male child, æt. 1 year, had a left lumbar hernia; when he came under observation of the surgeon, at the age of 18 years, it was about the size of an apple, and had been supposed to be a lipoma; "it swelled out when he coughed and could be reduced." a belt was applied.—Basset: *Bull. de la Soc. de Med. de Toulouse*, 1864.

CASE 13. A man, æt. 67 years, presented with a lumbar hernia of the left side; it was said to have originated from a blow on the loin with the fist; it gave but little trouble and was only partly reducible. A belt with metal pad was applied.—Grynfeltt: *Montpelier Med.*, tome xvi.

CASE 14. A man, æt. 46 years, had a lumbar hernia of the left side, which followed upon the healing of an abscess which originated in a severe contusion of the part. It could be wholly reduced and kept in place by a belt.—Sistach: *Recueil des memories des Med. Militaire*, 3d series, tome xix.

CASE 15. An elderly woman had a lumbar hernia of three years, duration situated in the left loin. It was probably a fatty hernia, though suspected to be omental; it was easily reduced, as it was of small size.—Auzias-Turenne: *Verbal Communication to Baron Larrey*.

CASE 16. A female, whose age is not given, nor the side mentioned, had a lumbar hernia which was mistaken for an abscess and incised; a fœcal fistula was the result but fortunately this ultimately healed.—*Prof. Dolbeau.*

CASE 17. A man, æt. 28 years, was shot in the abdomen and the ball lodged in the left loin; at this point an abscess formed; after its cicatrisation a hernia developed close to the scar. It was at first mistaken for an inflammatory swelling, but could be mostly reduced only some omentum remaining. After death this was confirmed by dissection; the opening was oval and just below the last rib.—*Larrey: Bull. de l'Acad. de Med., 1869, p. 160.*

CASE 18. A man, æt. 54 years, had a lumbar hernia of the left side, about the size of a small orange. It was evidently composed of fat, but at times intestine could be detected in its centre. It was accompanied by vague pains radiating from the loin, and *thought* to protrude through Petit's triangle.—*Gosselin: Gaz. Med. de Paris, 1881, p. 125.*

CASE 19.—A patient, sex not stated, æt. 6 years, had a lumbar hernia of the left side, after a severe fall in which the head and right side of the trunk were injured. It appeared to contain intestine and was reducible. The child died on the second day from the head injuries, but no post mortem was made.—*Decaïsne: Bull. de la Soc. de Med. de Gand, Jany., 1839.*

CASE 20. An aged female had a lumbar hernia of the left side, oval in shape, and about the size of an egg. It was largely fatty, but contained also intestines which could be reduced. The hernia caused, at times, vomiting and colic, but was never positively strangulated. It had been noticed five years before she came under the care of a surgeon.—*Marquez: Soc. Med. du Haut Rhin, 1869.*

CASE 21. A similar case to the last, with no mention of sex or side, but simply "an aged person," who had a lumbar hernia which gave no trouble, is reported by Levy: *Gaz. Med. de Strasburg, 1869, p. 275.*

CASE 22. An aged female had a lumbar hernia which twice became incarcerated, causing sickness and pain, when it was reduced and a belt applied. The side is not mentioned in the report by Triponel: *Gaz. Med. de Strasburg, 1869.*

CASE 23. A female child, æt. 6 years, had a lumbar hernia to develop in the right loin, as large as a small orange, at the site of a previous abscess. The hernia probably contained the colon. It was cured by a radical operation in which the sac was pushed back into the abdominal cavity without being opened, and the muscles sutured.—*Mr. Edmund Owen: Brit. Med. Jour., May 5, 1889.*

CASE 24. A male child, æt. 4 years, with an abscess of the left lumbar region, between crest of ilium and last rib. A surgeon had opened it and a large quantity of pus was discharged. It healed after some months, when a month after healing a tumor made its appearance, at a point where the quadratus and latissimus dorsi muscles intersect the internal and external oblique muscles, about the size of a goose egg; it was soft, and pressure forward and inward reduced it with a gurgling sound. It reappeared under coughing or muscular exertion.—Wellington N. Campbell, M.D.: *N. Y. Med. Jour.*, vol. 19, 1874.

CASE 25. A female, æt. 70 years, presented with a large tumor on right side of abdomen, commencing on a line between the false ribs and crest of ilium, and extending around in front nearly to the umbilicus; it was about 10 inches in diameter, irregular in form, apparently sub-cutaneous, soft and flabby, and under gentle pressure easily reduced into the cavity of the abdomen.—Jno. W. Currier, M.D.: *The Cincinnati Lancet and Clinic*, new series, vol. 3, page 98. 1880.

CASE 26. A female, æt. 63, with a lumbar hernia of the right side, about the size of a tea cup. It now and then presented some of the symptoms of a strangulation, but was easily reduced and retained by a bandage and compress. The woman was feeble and relaxed, the result of child-bearing. Pressure upwards, backwards and inwards reduced it. No history of injury.—John P. Apperson, M.D.: *Virg. Clin. Rec.*, vol. 3, page 651, 1873-4.

CASE 27. A male adult had a lumbar hernia of the right side; its diameter was 5", and was said to have protruded through Petit's triangle (?) and contain ascending colon—reducible.—Coze: *Revue Medicale*, 1874, tome 1, p. 407-410.

CASE 28. An adult male had a lumbar hernia on the right side, which was mistaken for an abscess and incised. This hernia was much smaller than the first case; both were in the persons of strong artillery men, and in both attributed to strains in riding.—Coze: *Revue Medicale*, 1874, quoted.

CASE 29. A male, æt. 33, had suffered from spinal caries and double lumbar abscess. The hernia followed close to the discharging sinus on the left side. After death the opening was found to be through the latissimus dorsi muscle, and a close investigation proved that Petit's triangle was wanting, and no evidence that it had existed.—D. H. Braun, *Langenbeck's Archives*, 24, page 213.

CASE 30. A man, æt. 24 years, had a right lumbar hernia which came through an aperture caused by necrosis of part of iliac crest, easily reduced, said to contain receding colon.—*Lang. Arch.*, 25, page 908.

CASE 31. A man, æt. 65 years, having died, a lumbar hernia of left side was discovered in the dead house. This case afforded an opportunity for a very careful post-mortem examination, which is the only recorded instance in which the pathological condition of the parts have been accurately studied. Mr. Hutchinson found that the hernia was originally a fatty protrusion which passed through a distinct round opening in the latissimus dorsi muscle, and to the inner side of the so-called Petit's triangle. The hernia contained intestines and was covered by a peritoneal sac, which sac returned with the intestines when the latter was reduced.—Jonathan Hutchinson, Jr., F.R.C.S.: *British Medical Journal*, July 13, 1889, page 71.

CASE 32. A man, æt. 68 years, had noticed a lump in his left side for 15 years. Usually it was about the size of his fist, but frequently it became larger, and never altogether disappeared. On several occasions it became enlarged, painful, and evidenced symptoms of obstruction. When seen the tumor was as large as a child's head and occupied the left lumbar region. Symptoms of strangulation for the last two days, and an operation resorted to for relief. The sac contained a coil of small intestines, inflamed and granular, then another coil gangrenous, and also the sigmoid flexure, which had become twisted upon itself. The sac opened into the peritoneal cavity, and across its neck were two fibrous cords which had produced the strangulation. Upon the division of these cords, reduction was easily accomplished. The gangrenous coil of small intestines was excised to the extent of 13 inches and united by Lembert's stitches of fine silk; the sac carefully separated from its attachments, cut away at the neck, and, together with the margins of the wound, carefully united by a continuous suture of fine cat-gut. There was no autopsy permitted two days after, when the patient died, but observation at the time of the operation showed that protrusion took place in front of the quadratus and had expanded but not perforated the latissimus dorsi, the sac lying between the muscle and the aponeuroses of the transversalis. The rupture did not seem to have come through the triangle of Petit, as it has been commonly supposed to do.—G. H. Hume. M.D., *Brit. Med. Jour.*, July 13, 1889, page 73.

CASE 33. A male child, at birth, showed large lumbar hernia of left side.—C. H. Mastin, M.D.. *Subject of this report.*

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TWO SUGGESTIONS IN SURGICAL TECHNIQUE.¹

I. A NEW METHOD OF COMPRESSING THE SUBCLAVIAN ARTERY.

II. A NEW METHOD OF ASCERTAINING WHETHER THE BLADDER
IS OR IS NOT RUPTURED.

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I. COMPRESSION OF THE SUBCLAVIAN ARTERY.

All surgeons know the difficulty of maintaining steady and effectual occlusion of the subclavian artery by pressure above the clavicle on the third part of the artery where it crosses the first rib. A recent and difficult case that I witnessed drew my attention to the subject afresh, and it occurred to me that compression might be much more effectually accomplished by an elastic band passing over the shoulder, down the back, under the perineum, and up in front of the trunk. It is analogous in its mode of action to Mr. Jordan Lloyd's method of compressing the external iliac artery. I have had no opportunity of putting it into practice in any actual operation about the shoulder-joint, but I have tried it on the living, and found it perfectly effectual and easy of accomplishment.

The strong elastic strap or band which comes with Es-march's rubber bandage is the best means of applying the pressure. A suitable roller bandage, two inches wide, is placed above the clavicle over the position of the artery as ascertained by the touch. The elastic strap is then passed, as described, over the roller bandage, down the back, between the thighs,

¹Read before the Philadelphia County Medical Society, February 12, 1890.

and up in front of the trunk. The ends can either be held by an assistant, or, better still, be tied or hooked together. (Fig. 1.) If it is desired to release the artery, the rubber strap is slipped off the bandage; pressure can be renewed as easily. An assistant should stand on the side of the patient opposite to that on which the operation is to be done, to steady the elastic strap and roller bandage in position.

The advantages of the method now proposed are, that it is reliable; that the elastic band will maintain compression, even though the patient should struggle during the operation; and



FIG. 1.



FIG. 2.

not only is the assistant not tired out by the fatigue of compressing the artery, but he has one hand free to assist the operator, if need be. Its chief advantage, of course, lies in its absolute certainty and continuousness. An Esmarch bandage can, of course, be applied to the arm previous to applying the compression. [The method was shown on a patient, and its efficacy verified by several members of the Society.]

ADDENDUM.

Further experiments in the method I proposed, since reading the above paper, have led me to modify the means employed, as follows:

With the elastic strap of the Esmarch bandage I have found some difficulty in retaining in place the roller bandage over the subclavian. It has a tendency to fall downward over the clavicle, and outward toward the shoulder. To obviate this, I have resorted to the elastic *bandage* of Esmarch instead of the strap, and have applied it as follows: The tendency to displacement of the roller bandage downward below the clavicle is counteracted by laying the end of the bandage on the chest, and carrying it over the shoulder and down the back. If the elastic strap is used, the natural tendency, when it is placed in position, is to pull upon both ends at once, and the upper end being drawn downward tends to displace the roller bandage downward. If it is applied by the elastic *bandage*, as now described, traction being always made with the unrolled part of the bandage, over the shoulder *from front to back*, this subclavicular displacement is prevented. To prevent the outward displacement I carry every alternate turn under the *opposite axilla*. By this means the roller bandage is held in place absolutely, even without care from an assistant.

II. A NEW MEANS OF ASCERTAINING WHETHER THE BLADDER IS RUPTURED BY INJECTING FILTERED AIR INTO IT.¹

This, also, I have had, as yet, no means of testing in the living body. When using Senn's hydrogen test, on an animal recently; the idea occurred to me that it would be an excellent means of ascertaining the fact of rupture or non-rupture of the bladder. In order, however, to make it more available, the following modification suggested itself to my mind:

1. Introduce the catheter and empty the bladder of any urine that may be present.
2. Connect the catheter with an ordinary Davidson's syringe. This should have been disinfected. Over the distal end

¹The subject-matter of this paper had been in my mind for some weeks, but on the very day on which I wrote it, I read a reprint of a paper by Dr. T. S. K. Morton, from the *Journal of the American Medical Association*, January 4, 1890, in which I found that he had already made the suggestion to use insufflation of hydrogen for a similar purpose. I was not aware until then that it had been suggested before. Filtered air seems to me, for the reasons stated, to be much simpler, and therefore more useful, than the method suggested by Dr. Morton.

of the syringe a moderately copious mass of absorbent cotton is tied. If the operator prefers, he can connect the distal end by a rubber tube, which has been padded with absorbent cotton, which may itself have been made antiseptic. The cotton in either case acts as a bar to the entrance of germs as in the tubes of bacteriologists. Air is then pumped into the bladder. Should no rupture have occurred, the rounded, elastic, tympanitic bladder will appear in the hypogastrium. Should there be a rupture, the air will escape through the rent into the general peritoneal cavity, and distend the entire belly. It is perhaps even a needless precaution to have the air filtered free from germs in carrying out this procedure, for should the bladder be ruptured, laparotomy, of course, would be done, and the unfiltered air of the room would gain free access to the peritoneal cavity from the abdominal wound. If the bladder is not ruptured, the air pumped in would, of course, escape at once by the catheter, and have done no harm; but I should decidedly prefer to filter the air, and so exclude any possibility of infection.

The great advantage filtered air would have over hydrogen is, of course, the ease and instantaneousness with which it can be used.

ADDENDUM.

A modification combining Dr. Weir's method with water has occurred to me as follows: If a quart or larger-sized bottle be connected to the catheter by rubber tubing and filled with filtered air, water could be poured into it by a second tube and funnel, thus forcing a measured quantity of air into the bladder by hydraulic pressure. Then substituting a Davidson syringe for the funnel and sucking the water out, the air would be drawn from the bladder back into the bottle and the amount measured. If equal to that just injected, it would be an additional evidence of non-rupture of the bladder. An error, however, might arise from the easy compressibility of the air.

FURTHER REPORT OF RESULTS OBTAINED IN A
CASE OF REMOVAL OF THE POSTERIOR
WALL OF THE SPINAL CANAL AND
OPENING OF THE DURA MATER
SPINALIS IN THE UPPER DOR-
SAL REGION FOR PARA-
PLEGIA.¹

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THE following remarkable case was published somewhat prematurely in the June number of the ANNALS OF SURGERY for 1889. Since that time great progress has been made by the patient and it is now our object to place on record his present condition.

In order that this account may be readily comprehended a brief review of the case will be necessary.² The patient was a

¹Read, and patient presented at the meeting of the American Neurological Association, June 4, 1890, Philadelphia.

²For detailed history the reader is referred to ANNALS OF SURGERY, June, 1889, Case I. C. K.

German, æt. 55 years, with unimportant family and personal history. On December 25, 1887, he was attacked with severe pains in the arms and shoulders, burning and shooting in character and attended by pain on motion, but no loss of power. He described it as rheumatism.

Three or four days later, however, he noticed distinct weakness of the thighs. This weakness increased and spread rapidly down the legs to the feet, and upward over the trunk as far as the breast, and, in the course of eight days, had deepened into absolute paralysis of the parts involved, including both sphincters. At the same time the paralyzed parts became the seat of profound anæsthesia. The latter extended up to the level of the nipples, at which point an intense girdle pain also made its appearance. A bed sore, trophic in character, followed in time, and added to the patient's sufferings. All of the reflexes of the legs, both deep and superficial, became exaggerated. Percussion of the spine elicited pain over the third and fourth vertebræ, and to a less extent over the fifth. Flexion and torsion of the trunk also gave rise to pain in this region, while slight blows upon the head in the direction of the spinal axis gave rise to frightful exacerbations of the girdle pain.

For upwards of ten months this man's condition had grown gradually worse, until the full development of his symptoms, as detailed, had been reached. His general health had suffered severely, and certainly the prospect of recovery was anything but hopeful. Internal therapeutics had been exhausted, and, as, already reported, in accordance with a consultation of the neurological staff and Dr. White it was decided to trephine the spine. The operation was regarded by us as exploratory in character, though the symptoms pointed directly to a localized affection of the spine, or of its immediate contents.

The fifth, fourth, third, second and first dorsal spines and laminæ were successively removed, and the exposed dura, which seemed unusually thickened and resistant, was incised and opened for a distance corresponding to the length of the wound. The dura was found to be very adherent to the subjacent pia mater by numerous fine bands of new connective tissue, especially in the upper angle of the wound. These ad-

hesions were separated with some little difficulty. The cord was then cautiously explored with the finger, but nothing further was found. The subsequent surgical progress of the case was all that could be desired.

A few hours after the operation, the effect of the anæsthetic having entirely passed off, the patient stated that the girdle pain had entirely disappeared; nor did it at any subsequent time return. On the following day there was distinct though very slight return of sensation in the feet, and this steadily increased day by day. Errors of location as regards the level of the impression and allocheiria were present and quite persistent. On the sixth day a barely discernible voluntary movement of the toes of the right foot was observed. Little by little a return of voluntary motion obtained, until some two months later when he could distinctly move the feet and the muscles of the thighs. Sensation, too, steadily improved, allocheiria disappearing and few errors of location being made. In addition the bed sore had promptly healed and some slight control had been regained over the sphincters. This was the patient's condition up to April, 1889, the date of our previous publication. The operation had been performed October 17, 1888.

During the months of May and June the gradual and gratifying return of spinal functions continued, and by July very good control of the urinary sphincter had been regained. He was now capable also of extending and flexing the legs and thighs at will, and a little later he insisted on being raised to the sitting posture. About this time also his control over the bowel became more decided. His improvement continued unabated until the latter part of August when he had the temerity to attempt a few steps out of bed. He was, however, restrained in his efforts in this direction for some time longer, and his ambition limited to sitting up in a rolling chair. In getting in and out of bed, however, he showed such a decided return of power that limited efforts at walking were soon permitted. His progress now was relatively rapid and he soon learned to walk the entire length of the ward with the aid of a cane.

At present he has almost completely recovered. He walks

freely about the nervous wards and about the immediate hospital premises. He ascends stairs without much effort. He dresses and undresses without assistance and has a normal control over the sphincters. His gait is, however, a trifle spastic, and there is a very considerable dragging of the right foot. The knee jerks are still a little above normal, and ankle clonus can only at times be elicited. Cutaneous sensibility seems to be thoroughly re-established.

In Fig. 1, the scar of the wound and traces of the bed-sores are well shown. The posture is quite good, and yet the transverse folds in the lumbar region suggest a more or less marked lordosis which, indeed, is more clearly revealed in the lateral view, shown in Fig. 2. The attitude here assumed is very peculiar. The patient is trying to stand erect, with the head and eyes somewhat elevated. The shoulders are thrown far back, and a great effort is being made to elevate the head. The pendulous belly suggests, and doubtless correctly, that this peculiar position is in part due to a general weakness of the truncal muscles still persisting. However, the loss of the extensive bony insertions of the various muscles involved in raising the head, a loss entailed by the removal of the spines and laminae of so many vertebræ, affords the true explanation of this attitude. The difficulty in raising the head is, however, relatively of little consequence. Certainly our patient does not seem to be decidedly incommoded by it.

The site of the wound is filled by dense fibrous tissue, which appears to afford ample protection to the cord beneath.

A question of great theoretical as well as practical interest now presents itself. In looking back over the case, we ask ourselves what is the rationale of the recovery? What was it that the knife accomplished that resulted so happily to the patient? Evidently it could not have been the mere relief of pressure. The cord lies loosely within the spinal canal, and the dural thickening observed by us could not have encroached materially upon its territory. The adhesions, however, must have played an important part in the production of the symptoms, and the actual service accomplished by the knife is here very evident. That, however, the adhesions were sufficient of themselves to explain all of the symptoms it would

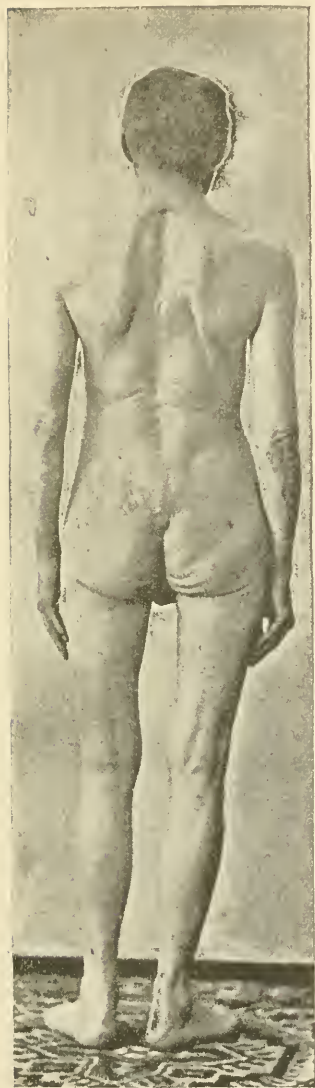


FIG. 1. POSTERIOR VIEW OF PATIENT, SHOWING CICATRICES.

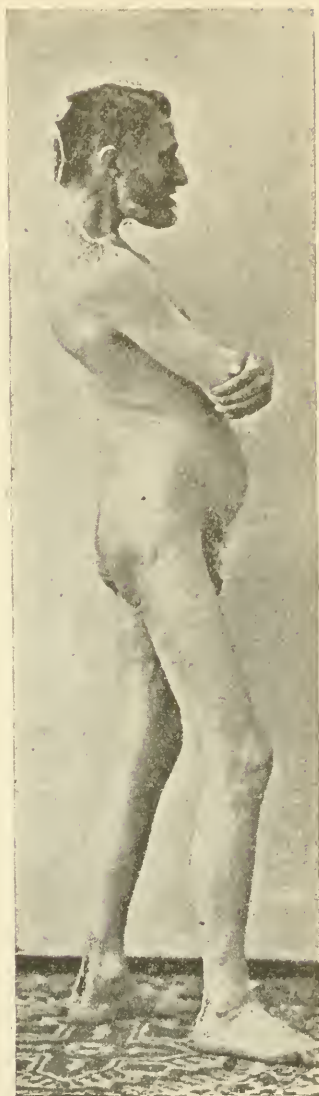


FIG. 2. LATERAL VIEW OF PATIENT, SHOWING ATTITUDE AND GAIT.

be absurd to assume. Doubtless the case was one in which a more or less diffuse myelitis existed, associated in the upper

dorsal region with a marked meningitis, the latter involving both membranes. In this way only can we account, on the one hand, for the pain elicited on percussive flexion and transmitted shock, and, on the other, for the widespread paralysis and the trophic changes.

Is it not proper, then, to assume that the result achieved in this case is due, not alone to the laying open of the dura and the destruction of adhesions, but also to a reaction of nutrition, the result of the surgical trauma? Certainly surgery is not wanting in instances of such reaction, as witness the occasional recovery in tubercular peritonitis as a consequence of laparotomy. It would seem as though the local shock had been promptly followed by a corresponding reaction in which the vitality of the tissues had been raised sufficiently high to determine a return to the normal state. Certainly the case before us is not only unique but exceedingly suggestive.

EDITORIAL ARTICLES.

REICHEL ON THE ÆTIOLOGY AND SURGICAL TREATMENT OF SEPTIC PERITONITIS.¹

The first part of Reichel's paper consists of a critical review of former experiments upon the production of artificial peritonitis by other observers, as well as himself. He likewise refers to some experiences in gynæcological laparotomy, and the septic peritonitis following thereon, and draws certain conclusions from these, as follows:

The absence of evidences of peritoneal inflammation in those who have died after laparotomy does not necessarily combat the belief that the cause of death was due to septic intoxication. As corroboration of this it is observed that persons dying from ileus and with intestinal paralysis resulting therefrom, perish from sepsis, before the occurrence of peritonitis.

In experiments upon animals Reichel found wide and unexplainable differences in individuals in respect to the susceptibility of the animal itself, as well as to the ability of the peritoneum to absorb septic material. The important point was developed by Reichel that some animals, which in the first instance successfully resisted the deleterious effects of the infectious material introduced by the frequent introduction of these small quantities finally came to resist the larger ones, and thus an artificial immunity was established against the effects of septic material upon the peritoneum. Grawitz' assertion that *tæcal* matter is not necessarily infectious is combatted by Reichel, who found that its presence in the peritoneal cavity was an active source of infection; this latter being in harmony with everyday experience. Grawitz likewise advances the belief that the peritoneal inflammation is most

¹*Deutsche Zeitschrift f. Chirurgie*, bd. xxx, p. 1-84.

frequently due to the removal of large patches of peritoneum; but Reichel in his experiments shows that large portions thus removed do not give rise to peritonitis necessarily.

Reichel's studies upon septic peritonitis following laparotomy are based upon 174 cases occurring at the Berlin Gynæcological Clinic. In general, as he shows, the simpler and more uncomplicated the operative procedure the more uninterrupted the course to recovery, and the better the prognosis. Abdominal ascites, or the presence of fluid which has escaped from cysts in the peritoneal cavity, is an unfortunate complication, at least 22% of the fatal cases dying from sepsis arising from this cause. Explorative incision in those cases which proved to be malignant seems to have been a not dangerless procedure, 20% dying from infection following its performance. Peritonitis arising from twisting of the pedicle of an ovarian cystoma does not necessarily give rise to sepsis nor increase the danger thereto, save as it gives rise to a larger number of adhesions and increases thereby the amount of wound surface exposed by the operation. The belief of Kümmel that, even in the most carefully conducted antiseptic laparotomy, germs will find their entrance into the peritoneal cavity, is supported by Reichel. The explanation of the immunity from sepsis which these patients enjoy is to be found in the rapidity with which the effused peritoneal fluids, with the germs, are taken up by the serous membranes and transferred to the blood current, from which latter they are readily eliminated. The most important conditions favoring the occurrence of septic peritonitis are stated as follows :

1. The occurrence of large quantities of fluid in the peritoneal cavity which it is beyond the power of the serous surfaces to resorb, or the constant renewal of the supply of pathogenic germs in the abdominal cavity.
2. The arrest of putrefactive material in dead spaces.
3. A disturbance of the powers of resorption of the serous membrane as well as an increase of transudation from its surface. (Ascites, carcinoma, etc.)

Prophylaxis, antisepsis and asepsis, in view of the exceedingly unfavorable prognosis, must be the main reliance in septic peritonitis.

The method of Mikulicz of packing iodoform gauze into the peritoneal cavity is objected to by the author on account of the danger to be apprehended from iodoform poisoning, as well as those which may arise from removal of the gauze. The fear of favoring ventral hernia by this method is also considered. Stress is laid upon the necessity of operating early following a non-septic peritonitis should the case require laparotomy, in order to avoid the increased dangers arising from the presence of extension and dense adhesions.

Experimental attempts to successfully treat septic peritonitis, artificially produced in animals were almost entirely without success. Irrigation of the peritoneal cavity with sublimate, chloroborate of soda, salicylic acid, etc., were useless; the animals quickly perished. Laparotomy performed after the introduction of fæcal matter, for the purpose of cleansing the peritoneal cavity, and prior to the development of peritonitis, resulted in the same manner. Irrigation, according to Reichel, is not only useless but, even in healthy animals, proved to be an injurious measure. Somewhat better results were obtained by sponging gently the peritoneal surfaces, after opening the abdominal cavity, with bunches of gauze, and employing the gauze in drains of Mikulicz. In 9 experimental cases in dogs, 2 recoveries were obtained by this means.

The author is extremely skeptical concerning the value of the so-called surgical treatment of peritonitis. The only conditions in which it is at all likely to be of service is in the empyæma-like, or encapsulated septic peritonitis arising from intestinal perforation, in which there exists an early opportunity of cleansing the cavity and closing the perforation. These views are in accord with the experiences of surgeons of the present day, particularly in gunshot and stab wounds of the peritoneum, in which the tendency to early interference is becoming more and more marked.

GEORGE R. FOWLER.

STEINHAUS ON THE ETIOLOGY OF ACUTE SUPPURATIONS.

It has long been a matter of absorbing scientific interest to the pathologist as well as of practical importance to the surgeon, to investigate the direct causes of every kind of suppuration, and the views generally held on this subject have from time to time undergone various changes. Readers of the ANNALS will remember how, after the experiments of Uskoff, Orthmann and Councilman, the theory that there could be suppuration present in the living tissues without the presence of micro-organisms was very generally accepted, but that, after other experimenters (Scheuerlen, Klemperer) had similarly repeated these investigations, the general opinion was in favor of excluding suppuration from any other cause but from the action of bacteria.¹ These experiments have continued since that time, until we have at the present date an immense amount of material amassed, dealing only with this subject, but giving in great part the most contradictory evidence, and requiring for its review alone a great expenditure of time and labor.

Quite recently Dr. Steinhaus, assistant at the pathological laboratory of the University of Warsaw, has undertaken this task. But not only has he given us, in the form of a pamphlet published in Germany² a complete critical review of the literature of the subject under consideration up to date; he has also taken the trouble of repeating all the experiments hitherto described with a view to confirming or disproving them, and has thus added the results of some 300 experiments of his own to his work. We give a short abstract of his work in the following pages.

To begin with, the methods employed by the author in his experi-

¹ANNALS OF SURGERY, Vol. 3, 507. 1886.

²Julius Steinhaus, Die Etiologie der Acuten Eiterungen. Leipzig. Veit und Comp. 1889. New York, G. E. Stechert.

ments deserve attention, since with their approbation his results must stand or fall.

The sterilisation of the substances injected beneath the skin of animals was done with Koch's apparatus. For injecting, the syringes composed of glass and metal were boiled for one or two hours in a 3 or 5 % carbolic solution, and well rinsed out in sterilised water. Very long needles were used, so that none of the injected fluid might come into contact with or in any way influence the puncture-wound, since we know that the injected focus is frequently contaminated by infections from without, which may travel along the puncture-canal.

Strauss' method was also used to inject fluids under the skin, which consists in first cauterising an area of the skin, in order to render it aseptic, then introducing the pointed end of a thin glass tube into the tissues through the cauterised area, breaking off the point subcutaneously, expelling the liquid into the tissues, withdrawing the tube, and finally again cauterising the punctured wound.

The only drawback connected with this method of Strauss' is the fact that the cauterisation so largely promotes absorption that frequently no reaction whatever results.

The method of Cohnheim and Councilman was also used; in which cases little glass tubes filled with the various fluids were introduced into the subcutaneous tissue in the sacral region, and pushed along under the skin, to the cervical region, where they were broken after the first wound had healed; care being taken to move them once again just before breaking in order to avoid any encapsulations by connective tissue, which might have occurred.

Antiseptic precautions were of course taken throughout, the dressings usually consisting of a thick coating of iodoformised collodion.

Even after injection of pure cultures of various micro-organisms similar precautions were taken. Proper precautions, which are not, however, given in detail, were also observed during the post-mortem examination.

The cultures were raised on soils in accordance with Koch's methods; but the author also frequently used the extract of cibil instead of meat extract in their composition.

The cover-glass specimens used for examination of these cultures, as well as of the fluids of the body investigated, were not prepared by heat: The bacteria and cells were affixed to the cover-glasses by soaking them for an hour or two in a concentrated aqueous solution of sublimate. The coloring was generally done with hæmatoxylin and safranin.

We turn now to the consideration of the various substances experimented with by this conscientious worker.

Mechanical injuries to the tissues never resulted in suppuration unless bacteria were admitted. Foreign bodies made sterile, before introduction never caused suppuration.

Of inorganic chemical substances *water* was the first experimented with; distilled and sterilised it never produced suppuration when injected beneath the skin of rabbits, dogs, guinea-pigs, or cats. These results corroborate Orthmann's statements and those of Wegner. They are at variance with those of Ushoff, whose methods of sterilisation were probably insufficient.

Chloride of Soda in $\frac{1}{2}$ % solution was likewise readily absorbed by all four classes of animals, and without suppuration; which tallies with the results of Wegner and Councilman.

Chloride of zinc in 2 % solution subcutaneously injected in rabbits and cats produced necrosis of the fascia, the subcutaneous tissue, and the deep layers of the skin, without inflammation or suppuration. These results are compatible with those obtained by Rausche and Christmas; although in some cases where the injection was done more superficially and where the necrotic portions became exposed to the air, suppuration was observed by these experimenters. Grawitz and de Bary, however, traced this suppuration to the action of the micro-organisms contained in the air.

Sublimate was injected in 2% solution and in quantities of one cubic centimetre (mxxvj.) and was absorbed without reaction in dogs, cats, rabbits and guinea pigs. If, therefore, injections of this substance frequently causes abscesses in its clinical use, as in syphilis, this is because infection takes place through the puncture-wound. Grawitz and de Bary also experimented with sublimate and got similar results.

Calomel injected subcutaneously in rabbits, cats and dogs produced suppuration without bacteria, an identical result with that obtained by Chotzen and by Mazza. This pus showed degenerative features, most of the cells containing only the nucleus, round, oval, or oblong in shape, and hard to stain.

Mercury introduced in small globules under the skin of rabbits and guinea-pigs becomes incapsulated without suppuration. Small glass tubes containing mercury are blocked at the ends by a mass of pus-corpuscles without micro-organisms.

In dogs and cats a good deal of pus was found about the mercury, which had oozed out of the tubes, but this pus was free from bacteria.

These results are not incompatible with the large number of seemingly opposed results in experiments already published by Biedel, Orthmann, Strauss, Brewing, Klemperer, Zuckermann, Christmas and Rosenbach.

Only Riedel and Christmas obtained suppuration in rabbits, and then by injecting the mercury into serous cavities and the anterior chamber of the eye, respectively.

Nitrate of silver was used in solution of various strengths. In rabbits a 1% solution produced necrosis below the skin, but a 5% solution destroyed the entire skin. In one case only an ulcer formed after the sloughing process, secreting pus, which contained staphylococci. In dogs 5% solutions produced suppuration containing no micro-organisms.

In guinea-pigs 2% solutions produced sero-fibrinous inflammation in which no bacteria could be found; 4% solutions had the same effect as on rabbits.

Cats showed extensive phlegmonous conditions and suppuration without bacteria both after injections with 1% and with 5% solutions. The pus contained a great many cells with one nucleus which showed much affinity to the safranin stain. Dembczak, Grawitz and de Bary, Brewing, Christmas, Nathan all made similar experiments which do not vary in their results from the above, although the authors differ in their explanations.

Sulphate of magnesia did not produce suppuration in rabbits and guinea-pigs—a result identical with that of Scheuerlen.

Ammonia (liquor ammonii caustici) did not cause suppuration. Diluted with 4 parts of water as much as $\frac{1}{2}$ a cubic centimetre (℥viii.) was absorbed in rabbits without reaction. In guinea-pigs, however, even $\frac{1}{5}$ of a cubic centimetre (℥iij.) produced necrosis of the tissues; a similar result was noticed in dogs after the injection of ℥xvj., and in cats after ℥viii.

Zuckermann's and Brewing's results correspond with the above; and although Grawitz and de Bary observed abscesses without bacteria in dogs, yet Nathan, on repeating these experiments, found either absorption (after ℥xvi) or necrosis (after ℥xxx to lx.) without suppuration—a result corresponding to that of the author's.

Oil of turpentine produced suppuration when injected into the tissues in dogs and cats, and no microorganisms could be discovered with the microscope or with culture experiments.

In guinea pigs as much as ℥viii. was absorbed without inflammatory reaction, and in rabbits either absorption or temporary inflammatory œdema or sero-fibrinous inflammation without bacteria was produced according to the quantities used.

The results obtained by Uskoff, Orthmann, Klemperer, Krauzfeld, Scheuerlen, Rujis, Biondi, Zuckermann, Grawitz and de Bary, Mosso, Christmas, Nathan are in accordance with the above. As regards opposing statements, we find that Brewing and Passet did obtain suppuration with turpentine in rabbits, but it must be remembered that they allowed the glass tubes containing the oil to become encapsulated before fracturing them, and that, therefore, these conditions are not identical. Karlinski observed absorption of the oil in dogs without suppuration, but he made extensive use of the thermo-cautery, which may explain the more rapid absorption without reaction.

Croton oil, when diluted 1 part in 4 with olive oil and injected in rabbits and guinea-pigs, produced necrosis of the skin; when introduced pure, enclosed in glass tubes, in rabbits and dogs, the tubes were encapsulated without suppuration. Leucocytes were present in quantities, but none inside the tubes, having probably been destroyed there by the oil.

Strauss, Klemperer, Scheuerlen, Rujis, Zuckermann, Grawitz, de Bary, Christmas, all agree with the above in their results, while Gussenbauer, Ogston, Councilman, Passet are at variance.

Antipyrin in 50% sterilized solution injected subcutaneously in quantities from ℥ viij. to ℥ xvi. failed to produce inflammatory reaction in rabbits, cats, pigs and dogs.

This result is in direct contradiction to the experiments of Frick.

Carbolic acid injected as a 3% solution in doses of ℥ xvi did not produce inflammatory reaction in cats, rabbits or dogs. Riedel and Gussenbauer had arrived at different conclusions.

Petroleum produces suppuration without micro-organisms in dogs and cats, but merely sero-fibrinous inflammation in rabbits, a result which corresponds with the experiments of Klemperer, Rijis and Christmas, although it does not agree with the deductions then made from them.

Suanidin, a substance closely related to urea, was inserted in a 10% aqueous solution under the skin of dogs, cats and rabbits; encapsulation ensued without suppuration. This substance had never before been experimented with.

Milk, sterilized and injected in quantities ranging up to ℥ xxx, was absorbed without reaction in rabbits, cats and dogs.

This corresponds with Orthmann's experiments—the contrary experience of Samuel and Uskoff being rejected as due to unreliable methods.

Pure cultures of *staphylococcus pyogenes aureus*, after having been allowed to develop for sixteen days at 24° C. were first killed and then subcutaneously injected in dogs in quantities of ℥ xvj, and produced abscesses free from bacteria. In cats, twice the amount was injected after having been evaporated down to half its volume, and also produced abscesses. In rabbits these quantities were rapidly absorbed. Tubes, however, filled with the cultures, produced small quantities of pure pus without bacteria, which plugged the ends of the tubes. This experience corresponds with the assertions of Pasteur, Scheuerlen, Grawitz, de Bary, Karlinski, Christmas—while Leber and Christmas succeeded in getting suppuration by extracts from the cultures—the

one a crystalline product, the other an albuminoid. Microscopically the pus thus produced in no way differed from that caused by bacteria.

Dead cultures of *bacillus prodigiosus* used in the same manner produced sterile abscesses in dogs and cats and were absorbed in rabbits; except when introduced in glass tubes. In this case pus formed and plugged the openings.

Grawitz and Bary obtained similar results when the culture was made on agar-agar; but when made on blood-serum soils no inflammation followed. Wyssokowitsch also proved the pyogenic nature of the germ for rabbits.

Bacillus pyocyaneus, the bacillus of blue or green pus, in inspissated and sterilized cultures, produced abscesses without bacteria in cats after subcutaneous injection. Injections of μxvj in dogs, guinea-pigs and rabbits, were absorbed without reaction; but on introducing the glass tubes, pus could be traced at the ends of the tubes.

Ledderhose, repeating some experiments of Ernst, had also found suppuration without bacteria, in some cases where he had used this micro-organism.

Bacillus anthracis, cultivated in gelatine and sterilized, was absorbed in quantities of μxvj in rabbits and cats without inflammation when injected under the skin. Introduced in glass tubes, however, it caused pus to form in small quantities. These results are somewhat at variance with Wyssokowitsch's deductions.

Live *staphylococcus pyogenes aureus* and albus in suspension in salt solution (0.6%) in quantities ranging from half to one cubic centimeter ($\mu viii$ to xvi) produced no abscesses in rabbits, but were absorbed without infection; also when gelatine-cultures were used which had stood for sixteen days. Intra-peritoneal injections had similar results. Dogs, cats and guinea-pigs, however, were locally infected by these injections, abscesses resulting containing the germs. Mice were not influenced. Rabbits were not infected even when a suspension in grape-sugar solution was used (contrary to Bujvid's results). Grawitz and de Bary and Fehllisen had shown before, that small quantities of these micro-organisms injected with proper precautions so as to exclude infection from without, did not always cause abscesses.

Bacillus prodigiosus, injected subcutaneously in gelatine culture to the amount of \mathfrak{Mxij} produced abscesses in rabbits, cats and dogs; and peritonitis with metastatic abscesses when injected intra-peritoneally in rabbits. These results tally with those of Grawitz and de Bary and Wyssokowitsch.

Bacillus pyocyaneus always caused abscesses in dogs and cats; but in rabbits the same amount (\mathfrak{Mxvj}) of a gelatine culture produced only sero fibrinous inflammation, while twice the amount produced abscesses. In guinea-pigs \mathfrak{Mvij} produced sero-fibrinous inflammation only. Gruber and Ledderhose obtained somewhat similar results.

We see from the foregoing, that so far as our present knowledge is to be relied upon, we are justified in believing that suppuration in the living tissues is the result of some certain chemical action, which may be combined with the presence of bacteria, or may be obtained from pure chemical substances without the presence of micro-organisms. Whether this conclusion is of any great practical interest, or whether the remarks of Weigert and Councilman will still exert their influence, attributing to them a merely theoretical interest, remains to be seen; these gentlemen pointed out, that although in experiments, chemical substances may produce suppuration, yet, clinically, at the bedside, all suppuration met with was due to the action of micro organisms. This questions appears of special interest in regard to cold abscesses, the pathology of which still appears to be considered unsettled by many. The great merit of the work of Steinhaus lies in the fact, that he demonstrates that the action of the same micro-organisms varies greatly in different animals; and by this means he is able to unite a great number of apparently opposite experimental results.

In conclusion the author gives the results of his investigations of 49 clinical cases of suppuration—4 of chronic and 45 of acute abscesses and phlegmons. He comes to the conclusions that Rosenbach's view of the etiology of these abscesses is no longer tenable. This writer believed that the staphylococcus produced phlegmons more frequently, and the staphylococcus abscesses. But the present author found both as causing either; the staphylococcus in 66, the streptococcus in 20% of the cases; and both in 9%. In three of the chronic cases no micro-organisms were found.

W. W. VAN ARSDALE.

INDEX OF SURGICAL PROGRESS.

OPERATIVE SURGERY.

I. A Method for the Radical Cure of Hernia. By Mr. J. GREIG SMITH (Bristol). The author, from an experience of 30 cases, extending over a period of six years, recommends the following method:

An incision of suitable length, from two to four inches or more, is made over the neck of the sac, as in ordinary herniotomy. It is, however, carried higher up the abdomen, and at the upper end may often with advantage be curved outward a little way. The neck of the sac is first isolated; this is done first that the position of the spermatic cord and vessels may be determined and avoided in all future steps. Where it is possible to do so, the next step should be to hook the finger around the neck of the sac, pull it forward, and by a little manipulation to turn the scrotum inside out. The whole hernia is now on view, and is carefully surrounded with warm antiseptic sponge-cloths. The sac is now isolated by dissection and tearing from above downward, the cord being carefully freed and left with a full share of areolar tissue around it. If there is doubt at any point as to the limits of the sac, it should be at once opened, and the finger inside made to serve as a guide. If the hernia is reducible, it is returned when the sac has been isolated; but before twisting the sac an opening should be made at its fundus, through which the finger is inserted to make certain that the hernial contents are completely returned. If the hernia is irreducible, the sac is laid freely open upward and downward by scissors through an opening that has been made at a part where the contents are not adherent. To avoid points of adhesion to underlying parts, the incision may have to be guided in lines that are not straight. To give ad-

ditional room, and to minimise the bleeding from adhesions, it is usually best at once to ligature omentum at the neck where it is free from adhesions, divide it and at once return the stump with a long catch-forceps temporarily attached to it; on the distal side a forceps also is placed.

Then the subsequent steps of liberating adherent bowel and returning it, or of separating omentum from sac or bowel, or both, are proceeded with as circumstances direct. Some adhesions may be sponged apart; others require tearing and forci-pressure; while others demand ligation. The field of operation should be kept warm and isolated and clean by frequently changed sponge-cloths or large flat sponges.

All bowel being returned, and all omentum having been removed from the interior of the sac, and all bleeding having been checked, the fundus of the sac is grasped by two pairs of forceps, which are handed over to an assistant, who holds them well to the inside or the outside as the case may be, and rotates them as he is directed, thus twisting the sac. By turning the sac to one side or the other, and pulling more on one forceps than another, the peritoneal opening may be closed at one or other side of the hernial opening as we may desire, and not opposite to the opening. The assistant having given two or three turns to the sac, the forefingers, behind (feeling the cord) and in front, tease open the areolar tissue separating the neck of the sac from the inner parietes as high up as may seem desirable. Twisting, by gathering together the walls of the sac, very materially aids this process of separation. If the sac is exceptionally long, a piece of its fundus may be cut away. If it is very thin, it should not be twisted very tightly, in case vascular stasis and necrosis result.

The twisted and fully isolated sac now lies in the ring, with forceps attached to its fundus. Silk ligatures, with needles at both ends, are now placed, one ligature at the fundus, another at or above the neck of the sac. The ligature at the fundus is made to pass several times through both walls of the sac. The ligature, or rather suture, at the neck is made to gather together a sufficiency of areolar tissue on the sac. There is no strong objection to its perforating the sac; but it should not be made to surround it, on account of the risk of sloughing.

The sac is now laid across the opening, as nearly transversely as possible, and fixed by the sutures at its extremities to the firm parietes beyond beneath which it has been tucked. The aim is to get the internal orifice of the twisted sac opposite the strongest part of the parietes, and away from the internal opening. As a general rule, it is best to twist in a line opposite to that of the axis of the canal. But no absolute rule is possible; each case must be dealt with according to its peculiarities. By means of curved needles, held in a needle-holder, or by a handle needle like that of Macewen, the sutures are passed through the parietes under the retracted skin. The position of the deep epigastric is first ascertained and avoided. It is usually best to fix the fundus first; Supposing the fundus is placed to the inside, the fore finger of the left hand is carried upwards under the conjoined tendon, carefully separating the peritoneum. The finger acting as a guide, the needles are made to pass through the conjoined tendon and aponeurosis of the external oblique; or, if the hernial opening is large and the sac not small, through the rectus. They are made to take a good hold of the tissues, the sutures being at least half an inch apart. During this manœuvre the skin and superficial fasciæ are drawn inwards. The forceps are removed and the sutures pulled tight, while the attached fundus is guided into position. The sutures are now tied.

The forefinger of the right hand is now carried under the peritoneum on the outer and lower side of the opening, separating the peritoneum in the same way, and the sutures at the neck are introduced as far outward and downward as possible. If possible, they should be made to grasp Poupart's ligament and such fibres of the internal oblique and transversalis as may be within reach. When these sutures are tied, the sac is drawn completely inside the canal and lies obliquely across it. It fortunately happens that a large hernial opening is usually associated with a large sac, so that the available tissues are provided in necessary quantity. The dimensions of the sac must, however, be taken into account in fixing on the points for placing the sutures.

In small or even in moderately sized herniæ it is not necessary to place a fixation thread at the neck if the twisting is made to begin well

to the inner side of the internal opening. This thread may be omitted also if the sac is very thick and the areolar tissue dense.

The inguinal canal is now closed. Macewen's method of closing the internal ring is recommended. But in very large herniæ, in which the edges of the opening are surrounded by thick areolar—almost cicatricial—tissue, it may be impossible without dissection to isolate the conjoined tendon or the fibres of the internal oblique and transversalis. This dissection may be done and the layers caught; but it will usually be found sufficient to push the points of the needles obliquely upward through the internal pillar, taking in as much of the deep muscular layers as possible. On the under aspect of the opening the needles are passed, where possible, under Poupart's ligament, which is raised forward out of danger by the forefinger. The cord meanwhile will have been observed to be out of danger. Three, four or five sutures, according to the size of the opening, will be sufficient to close it. The fibres of the external aponeurosis will be crowded together and adherent. If it is difficult to close the opening, a few incisions made along the fibres will free them; and when the sutures are pulled tight, the opening is easily closed and their parallelism restored.

In congenital hernia certain variations in procedure are essential. The sac is completely divided just above the testicle, leaving enough tissue to form a tunic proper to the gland. A few sutures may serve to fix this tunic in proper position. If, as is not uncommon in these cases, the cord is firmly adherent to the sac, or lies in a special sulcus, then it is best to cut the sac completely away from the cord, leaving a long strip of sac attached to it. Division is carried well inside, and the sac may be twisted and otherwise dealt with as if it were entire. In some congenital herniæ there is a small neck, and perhaps a large mass of omentum in the sac. In three of these Smith cut the sac into two long flaps or aprons, and fixed the extremity of each flap on opposite sides of the hernial opening without twisting. The result was equally good.

The cutaneous wound is closed over a drainage-tube carried to the bottom of the wound on the abdominal aspect. Pressure over the ring induces œdema of the scrotum; a simple absorbent, fixed with strapping,

is sufficient. The scrotum rests elevated on a pillow of wool laid over a broad piece of strapping fixed to the top of the thighs.

At the end of three weeks or thereabouts the patient is permitted to get up and walk about. The wearing of a truss is detrimental.

In femoral hernia the same method may be used of placing the twisted sac across the opening—only that no attempt is made to close the opening and the neck is not fixed. One side of the sac is pulled well down, and torsion made in the opposite direction. The fundus of the sac is attached either on the outside above Poupart's ligament, or directly above the ring, or to the inside. The proceeding is extremely simple, there being no cord to consider, the opening always being small (except in some cases that have been operated upon for strangulation), and the sac in the majority of cases easily isolated.

In umbilical hernia the whole sac should be removed, with all superfluous cutaneous and fatty tissues, and the wound be brought together exactly as in an ordinary abdominal section.—*Bristol Medico-Chirurgical Journal*, March, 1890.

II. Billroth's Operative Methods in Fissures of the Soft and Hard Palate. By Dr. F. SALZER (Vienna). Young children are rarely operated upon; by preference the operation is limited to individuals who have passed their 14th year. The incision through the muscles of the palate to remove tension, introduced by Ferguson, is omitted, and instead of it the median plate of the pterygoid process is severed subcutaneously at the base of the hamular process, so that through temporary dislocation of the point of insertion, that is to say, of the point of fixation of the musculature, the continuity of the latter being thus preserved, the tension of the soft palate is removed. This simplification of the technique has now been successfully employed in 15 cases.

The child, with its head hanging backward, and the trunk elevated, is narcotized by a mixture of chloroform, alcohol and ether (10:3:3). By means of Junker's apparatus the chloroform vapors are blown directly into the pharynx through the mouth or nose; through a metal tube bent at an acute angle. A Smith speculum (modified and com

pleted by Billroth) is then introduced into the mouth of the child.

The operation begins with the freshening of the edges of the defect of the hard and soft palate. Hæmorrhage in this step of the operation, as well as in all the following, is controlled by temporary compression with gauze tampons.

After the lateral incisions on the outer side of the hard palate along the alveoli, beginning at the second incisor or first bicuspid tooth, and extending to the posterior border of the alveolar process, have been made, a chisel is inserted into the posterior angle of this incision against the pterygoid process, and by a few blows in a backward and upward direction, the median plate of the pterygoid process of the sphenoid bone is split off. Through prying motions with the chisel or the elevator (which is safer) it is made possible to displace this bone so far inward, so that the median edges of the wound of the soft palate may be brought into apposition.

The separation of the bridging flaps of the muco-periosteal covering of the hard palate is performed according to von Langenbeck's method. In order to adjust the wound-edges to each other at the border of the hard and soft palate, it was sometimes necessary to divide the nasal mucous membrane at the posterior edge of the floor of the mouth with Langenbeck's button tipped scalpel.

The sutures are inserted in the following way: Two, at the most three, auxiliary sutures, viz., quilt-sutures, of the soft and hard palate, are introduced, thus bringing the median edges of the wound squarely up together and preventing any tension of the few button sutures, afterward to be applied. The sutures are inserted by means of simple straight, arcuate or obtusely curved, two-edged needles, pierced at the point by an eye, and partly drawn through by Ferguson's loop method.

After the sutures have been tied carefully, the cavities of the nose and mouth are well irrigated with a 3% solution of salicylic acid. Finally, the lateral wound-fissures and wound-cavities are firmly packed each with a small strip of iodoform-gauze. This tamponade unites the advantages of being antiseptic and styptic, and is of quite an eminent importance for the immobilization and adaption of the

parts of the palate which have become movable, and it also greatly contributes to relieve the tension of the sutures. Therefore this tamponade should remain in situ as long as possible (about 10 days).—*Centralbl. f. Chirurgie*, No. 13, 1890.

ALBERT PICK (Boston).

HEAD AND NECK.

I. A Case of Revolver-Shot Wound of the Brain (Left Optic Centre). By PROF. V. A. RATIMOFF (St. Petersburg, Russia). The writer's case presents a considerable interest in both diagnostic and physiological regards. A healthy student, æt. 22 years, accidentally shot himself, into his head, from a revolver (the bullet 8 mm. in diameter), the injury causing a complete blindness, but no loss of consciousness. On examination 3 hours later, the author found a penetrating wound of the right parietal bone, situated 8 cm. above, and 3 cm. behind, the auditory meatus. The pupils and all movements of the eyeballs, as well as the ocular fundus, proved to be quite normal. The patient complained only of being totally blind; in fact there was nothing wrong beyond the loss of sight and facial pallor. On the third day the cranial wound was exposed, enlarged and explored; some depressed fragments and a mass of blood clots and crushed brain substance were removed, and a probe passed into the bullet track 4 or 5 cm. downward, but no bullet could be discovered. The wound was thoroughly cleansed, powdered with iodoform, supplied with a drainage tube, the cutaneous flaps closed with sutures, and an antiseptic dressing applied. On the next day the patient's sight strikingly improved; on the eighth, he could read any types, but there remained hemianopsia affecting the left half of the vision field on both sides. The patient survived 6 months. During the last $2\frac{1}{2}$ months of his life his sight gradually deteriorated, while there supervened excruciating headache, alternating with sopor, and contractions of the right extremities. The necropsy revealed two abscesses situated in the occipital lobes posteriorly, the left cavity containing the bullet lying free in pus. It was found that the bullet, on its way to the left occipital lobe,

had pierced the right hemisphere and longitudinal sinus, causing a profuse extravasation. Discussing the case, Dr. Ratimoff points out that, 1, it gives an unequivocal support to Munck's well known teaching, according to which the occipital lobes contain each a cortical optic centre; 2, the hemianopsia observed in the patient was caused by a destructive lesion of Munck's left optic centre; 3, a primary both-sided blindness was caused by the disintegration of the left centre, and by the compression of the right one by blood-clots; 4, a secondary loss of sight resulted from the development of the abscesses.—*Bolnitchnaia Gazeta Botkina*, Nos. 1 and 2, 1890, p. 26.

VALERIUS IDELSON (Berne).

II. Operations for Septic Thrombosis of the Lateral Sinus Consecutive to Aural Disease. MR. BALLANCE (London).—Four cases reported in which the supervention of cerebral symptoms as a sequel to a long-standing purulent discharge from the ear was held to justify the inference of thrombosis of the lateral sinus, for which an operation was in each case undertaken, in two of the four with complete success. The first case was that of a man, æt. 21, who had had a discharge from the ear for 15 years, and this had ceased suddenly some days before his admission to the hospital in May, 1889. There was pain in the ear, headache, giddiness, and, later on, shivering and vomiting. There was no tenderness or swelling over the mastoid, and no optic neuritis. In fact the general aspect of the case was that of typhoid fever, and nothing but the marked and rapid oscillations of the temperature saved them from that diagnosis. They decided to trephine, and deep down the bone was found to be green and offensive. The groove of the lateral sinus was filled with stinking pus, which was also traced along the posterior aspect of the petrous portion of the temporal bone. He removed all the diseased bone he could get at, and then tied the internal jugular vein in the neck, dividing it between two ligatures. The effect on the condition of the patient was marked and immediate, and 36 hours afterwards he was bright and cheerful. The pulse and the temperature were normal. In the following days he had symptoms of pulmonary infarct, and pain in the

ankle-joint and foot. A week later he had a large abscess in the buttock. At that time something projected from the wound in the mastoid region, which, on being withdrawn, proved to be one inch and a half of the walls of the lateral sinus that had sloughed away. In order to cut short any further septic complications, Mr. Ballance injected some mercurial solution with a syringe into the distal end of the divided jugular vein, and thoroughly washed out the vein between that point and the lateral sinus. A quantity of pus escaped from the vein when reopened. The patient ultimately did very well, and recovery was complete by August. (The patient attended and was examined by the Fellows). The second case was in a lad, *æt.* 18 years, admitted into the West London Hospital in August last, with the usual symptoms of headache and vomiting, going on to delirium, etc. There was a history of aural discharge since infancy. On admission he was dull, the temperature was 104° F., the tongue brown and dry, and there was swelling and tenderness over the mastoid, with optic neuritis. The same operation was performed, comprising the ligature of the internal jugular vein, and the same pathological changes were found. Death took place a day or two later from general pulmonary infarction, showing that the operation had been undertaken too late. The brain and membranes showed nothing wrong. The third case was that of a girl of 14, who had had a discharge from the right ear for two years. The external meatus was found to be blocked by a polypus. There was shivering, and there had been vomiting and delirium, but no *œdema* over the mastoid nor optic neuritis. Some slight albuminuria. Temperature 100° to 105° F. The same operation was performed, but after ligaturing the internal jugular vein it was found to include the clot, and an incision was therefore made lower down and another ligature applied. He then syringed through the vein into the lateral sinus, as before. The patient seemed to promise well, but succumbed unexpectedly to an attack of laryngeal spasm, due to the formation of a small abscess in the larynx. The fourth case was operated upon as recently as March 6, of this year, the patient being a woman *æt.* 24 years. The symptoms and treatment were substantially the same, and in spite of slight pulmonary and gastro-in-

testinal signs of infarction she was at present practically well. The author insisted upon the difficulty of establishing an early diagnosis, especially in the absence of a history of otorrhœa, and upon the inutility of operative interference which did not comprise ligature of the internal jugular vein. The principal points which were to be relied upon to establish the diagnosis were (1) a history of a discharge from the ear; (2) the sudden onset of the disease; (3) the extreme and rapid oscillation in the temperature; (4) the repetition of rigors and vomiting; (5) optic neuritis and other cerebral symptoms; and (6) tenderness and swelling in the mastoid region, with stiffness of the neck.—*Brit. Med. Jour*, April 5, 1890.

III. Cystopneumatic Degeneration of the Middle Turbinate Bone. By DR. E. SCHMIEGELOW (Copenhagen). The writer communicated to the Copenhagen Medical Society four cases of this disease. This consists of a bladder-like swelling of the anterior end of the middle turbinated bone, which then is transformed into a cavity holding air and opening into the meatus medius by means of one or more openings.

All the four cases were those of children resembling one reported by Glasmacher and four by Max Schäffer, which also were those of children. All the four cases suffered from *attacks of headache*, which were terrific in their intensity, and rendered the patients unfit for work temporarily, made them keep abed, and even in one patient caused vomiting. The mucous membrane which covered the bony cyst was in all polypously degenerated. The bony structures were quite distorted as a consequence of the pressure of the bony cyst, but the outer bones of the face were unchanged. The size of the cysts varied from that of a bean to that of a walnut, and in the largest measured $1\frac{1}{2}$ inches in length, in breadth $\frac{3}{4}$ -inch, and in height 1 inch. The cysts were removed by means of the pincet, the forceps, or the loop. The cavity of the cyst was lined with a large ciliated cylindrical epithelium, but the mucous membrane lacked glands. After removal of the cyst the headache and other symptoms disappeared.—*Hospitals-Tidende*, December 25, 1889.

IV. Colossal Nasal Polypus. By DR. E. SCHMIEGELOW (Copenhagen). Dr. E. Schmiegelow demonstrated at the meeting of the Copenhagen Medical Society of Oct. 29, 1889, an unusually large nasal polypus. Its structure was that of the usual serous fibromata or mucous polypi. It was 5 inches in length, and extended from the right nostril through the entire length of the nasal cavity back to the naso-pharyngeal space from where it sent down a prolongation which extended below the free edge of the velum palati. This caused continual movements of swallowing. The patient, a workingman, æt. 40 years, had only been troubled by the presence of the tumor some 14 days, when it began to bother him in his pharynx; otherwise it caused no other phenomena except to occlude completely the right nasal cavity. The polypus was removed through the naso-pharyngeal space by introducing a loop through the mouth and up back of the palate as high up as possible around the tumor, which was then extracted with ease. The place of attachment was found to be the posterior end of the right turbinated bone.

In the discussion Dr. Lange says he thinks he has seen a very great inclination in posterior nasal polypi to recur after removal, which removal is best done with a hook. Dr. Schmiegelow most easily removes such polypi by means of the piano string loop, but if that failed he would try the hook. The case described was operated upon through the mouth, as it was at first thought to be, on account of its hanging so far down, a pharyngeal polypus; indeed, it was so large as to be removable with difficulty through here. Dr. Laub, head physician of the General Hospital, mentioned a case (a woman) seen at the hospital, where mucous polypi were removed several times, but as she returned again and again with the same symptoms, the whole left nostril was found to be filled with a firm mass, which, removed with the forceps, showed itself to be a cyst. The hæmorrhage was quite considerable.—*Det Medicinske Selskab i Kjøbenhavn—Hospitals Tidende*, Dec. 25, 1889.

F. H. PRITCHARD (Boston).

CHEST AND ABDOMEN.

1. Pathogenesis of Certain Abscesses of the Breast. By

DR. BUDIN (Paris). The author contributes some clinical observations upon the mooted question as to whether mastitis occurs through the lymph vessels from fissures of the nipple, or from direct emigration of the inflammatory agents through the milk channels. He has positively demonstrated in a series of cases that in the beginning of the inflammatory process the cells could be forced, through pressure, from the milk ducts; these were shown, both by microscopical examination, as well as by culture tests, to contain germs in large quantity.

These facts were the basis of a therapeutic measure, which was employed in 8 cases of acute mastitis as soon as the presence of pus in the milk ducts was ascertained, these latter were once daily emptied by pressure, and in the course of 2 to 3 days complete cure took place.

Sprenal, of Dresden, in commenting upon these observations of Budin (*Centbl. f. Chirurgie*, No. 9, 1890), suggests that, granting that these are borne out by further experience, all children suffering from suppurative processes should not be allowed to suckle from the mother. Vice versa, Budin believes that the child itself may become infected from nursing a breast the site of a mastitis, and is disposed to trace certain cases of furuncle in small children to such an origin.—*Bull. del Acad. de Med.*, No. 15, 1889.

GEORGE R. FOWLER (Brooklyn).

II. Case of Penetrating Wound of the Abdomen. By DR. JOSEPH V. BERTENSON (St. Petersburg, Russia). A workingman, while suffering from an attack of delirium tremens, stabbed himself with a knife into the neck (without wounding the carotid) and abdomen, and was brought to the hospital unconscious and pulseless, with several intestinal coils protruding from the abdominal wound and covered with hay, straw, and all possible dirt and mud. After a hypodermic injection of camphor, the peritoneal cavity was thoroughly washed out with an antiseptic lotion, the bowels reduced into the abdomen, and both of the wounds closed with sutures. Four weeks later the man was up and about, in the best of health. "Nowadays," the author adds, "similar cases may place a forensic expert in a rather difficult position with

regard to determining the degree of dangerousness of a traumatic lesion, antiseptics having considerably changed our views on the subject." [Dr. Praxin, of St. Petersburg, also relates a case of penetrating wound of the abdomen with protrusion of intestinal mass. The latter was for some time lying in dirt and dust. A peasant woman washed out the bowels with ordinary water and returned them into the abdominal cavity. The patient made a good recovery.—*Reporter.*]—*Transactions of the Pirogovian Russian Chirurgical Society*, 1890, vol. vii., p. 12.

VALERIUS IDELSON (Berne).

III. A Contribution to Laparotomy for Abdominal Injuries. By P. POSTEMSKI. The cases reported by the writer are divided into two series.

The first series, four in number, considered by the writer, consisted respectively of rupture of the spleen with the skin intact, rupture of the intestines with also an intact skin, an abdominal wound with seven intestinal wounds, and an abdominal wound with prolapse of the intestine and incipient peritonitis. In all cases laparotomy was performed. Only one case, the latter, recovered; the first one perished from hæmorrhage and both the others from septic peritonitis.

The second series included eighteen cases, among which were fifteen where traumatic causes were the indications for the laparotomy. The cases in question here were six simple penetrating wounds of the abdominal walls, four with protrusion of the omentum, four with multiple wounds of the intestines, and one with injury of the liver. The first ten healed by first intention. They came under treatment one to three hours after the accident. The case of injury of the liver with very great hæmorrhage into the abdomen recovered. It came under treatment almost immediately after receiving the injury. A case with thirteen wounds of the small intestine also recovered in the same manner. Another, of the mesentery, with prolapse of a large portion of the intestine and omentum as hernia properitonealis from separation of the peritoneum. It came under treatment one hour after the accident. A stercoral fistula remaining after the operation healed spontaneously.

Three cases of simple intestinal injury resulted fatally; two from anæmia and only one from diffuse peritonitis. The injury of the intestines in the last case only implicated the serous and muscular coats. The intestinal sutures in both the other cases had holden well. All three came from $\frac{3}{4}$ to $1\frac{1}{2}$ -hours after the injury into the hands of the operator.—*Bull. della reale accademia med. de Roma*, Session of Feb. 24, 1889.

IV. On the Surgical Treatment of Long Lasting Abdominal Colics. By DR. LAUENSTEIN (Hamburg). The writer found upon operating upon a single lady, æt. 63 years, who for one year had suffered from abdominal disturbances with obstinate constipation, the transverse colon near the splenic flexure compressed by an omental band of the breadth of two fingers. This band was ligated in two places with silk ligatures. Recovery followed.—The cause of the formation of this constricting band is unknown.—*Fortschritte der Medicin*, 5. 1890.

V. A Case of Perigastric, Sacculated, Suppurative Exudate After Acute Phosphorus Poisoning. By AXEL HAGGQVIST. A servant girl, æt. 25 years, who being pregnant already three months and trying to produce an abortion swallowed the heads of some phosphorous matches. After the abortion had occurred, there developed with grave disturbances of the general condition, chills, continuous and remitting fever-movements, violent pains in the gastric and hepatic regions, much albumen in the urine. There was an abscess in the abdomen which caused the abdominal walls of the epigastrium to bulge outwards, which was opened in the median line and drained. It contained $1\frac{1}{2}$ liters of a yellowish green putrid and blood mixed pus. The exploring finger introduced through the opening could be placed behind the spinal column and slightly upwards and there found what was thought to be the stomach compressed into a small space; the diaphragm could be felt above the spleen, and on the right above the left lobe of the liver. The cavity, which after evacuation diminished rapidly in size, was crossed by finer and larger fibers.

The patient recovered entirely. The origin of the abscess may be explained in two ways: either it was caused by circumscribed distruction of the stomach wall and subsequent peritonitis, or from a phlegmonous gastritis caused by the phosphorus.—*Upsala Täkareforen Forhandl.* Bd. xxv

F. H. PRITCHARD (Boston)

VI. Echinococcus of the Spleen. By DR. EDMONDO COEN. Echinococcus of the spleen, according to the consonant opinion of clinicians and anatomists, is of rare occurrence, most rarely is it found solitary in this organ. The statistics of *Frey* show $3\frac{1}{2}\%$, those of *Neisser* 2.83% as to their frequency. The writer reports on three cases of echinococcus of the spleen which were accidentally observed in the pathological institute at Bologna.

CASE 1. A woman, æt. 70 years, who had died from marasmus. Here there was found a solitary echinococcus cyst which divided the organ into two segments, completely separated one from another. The cyst wall had several small pieces of the spleen enclosed within itself.

CASE 2. A man, æt. 46 years, death from meningitis. A solitary echinococcus was found on the concave surface of the organ, sunken deeply into its parenchyma and covered by a firm and partly calcified capsule.

CASE 3. A man, æt. 40 years, death from cardiac insufficiency. On the convexity of the spleen was an echinococcus cyst: an echinococcus of the liver was also found at the same.

In none of the cases were there any disturbances during life which indicated a splenic affection. In the literature there are known up to now only fifty-eight cases of solitary splenic echinococcus and forty-two cases where other organs besides the spleen were affected. From this is seen the relative frequency of the solitary echinococcus. It is observed more frequently in males than in females. Its size is variable; often it forms enormous tumors (*F. v. Kuehn*, II $\frac{1}{2}$ *pd.*). Usually only one single tumor is formed. Among the forty-two cases of the second series the parasite lodged thirty-six times in the liver, ten times in the omentum; five times in the parietal layer

of the peritoneum; four times in the heart; four times in the lungs; four times in the kidneys, etc. The splenic tissue is either but slightly altered or it is altered till but little remains. Continual growth of the cyst may disturb the continuity of the organ and loosen its fixation (floating spleen). The individual afflicted has mostly no disagreeable symptoms. Sometimes one sees grave disturbances; pains in the splenic region, phenomena of compression of the stomach, of the intestine or the ureter; displacement of the diaphragm, of the left lung or of the heart; suppuration of the cyst's contents and peritonitis in consequence. The result varies. Recovery may take place from sacculation (calcification of the capsule) and death of the parasite. Suppurative processes lead to rupture and evacuation of the contents into the neighboring cavernous organs, as into the intestine, for example in a case of *Berthelot* where after evacuation of twelve hundred vesiculæ per rectum recovery took place. Recovery has also taken place after evacuation through the air passages; if it breaks into the peritoneal cavity fatal peritonitis follows. As to therapeutic measures only surgery comes into consideration; puncture with or without injection of iodine or carbolic acid (obsolete), laparotomy and splitting of the cyst-wall and extirpation of the spleen.—*Bull. del. sc. med. Bologna*, 1889. vol. xxiii. Ser. vi.

F. PRITCHARD (Boston).

VII. On Parietal Hernias. By KR. POULSEN (Copenhagen). After a brief consideration of the various theories on the origin of parietal hernias, the writer reports on thirteen cases treated in the Copenhagen "Kommune Hospital" during the last twenty-five years. In nine cases the diagnosis was only made at the herniotomy: in three cases taxis was tried; all three patients died and the necropsy showed the patients to have had the parietal form; once the hernia was only discovered at the necropsy (hernia obturatoria).

The view that hernias of the intestinal walls only develop in a preformed hernia-sac and preferably make their appearance in consequence of this where there are small pouches of the peritoneum, as the crural canal and the obturator foramen, finds a confirmation in these thirteen

cases, for eleven of these were femoral and two obturator hernias. The youngest patient was 36, the eldest 83 years of age. Among these cases there were twelve females and one male. The two patients with obturator hernias perished. Once the hernia was first revealed at the post mortem examination; in the second case laparotomy was performed. Of the eleven femoral seven were gangrenous, of which six ended fatally, while one with the formation of an artificial anus recovered; in the four nongangrenous hernias herniotomy was performed each time with a favorable result.

The writer would make it distinctly understood that in such cases the prognosis should be given in these varieties of hernia with great caution; on account of the incomplete occlusion of lumen of the intestine phenomena of incarceration may not make their appearance, or they may be very slight, but yet there may be gangrene of the incarcerated intestinal wall. If one has diagnosed a parietal hernia then herniotomy is to be preferred to taxis. Only by means of an operation can one judge of the condition of the intestine and be sure of a successful reposition.—*Hospitals Tidende*. 1889. 3, *Række*, Bd. vii. No. 18.

ALBERT PICK (Boston).

VIII. On the Development of the So-called Strumous Bubo and the Indications for Their Early Extirpation. By DR. H. G. KLOTZ (New York). Strumous buboes are generally considered as developing from a common bubo in subjects of a strumous (tuberculous or scrophulous) constitution (Bumstead & Taylor, Lang, etc.) or to be the outgrowth of syphilitic adenitis in strumous patients (Zeissl). On the strength of more than 120 cases, which came under his care in the German Hospital of New York, during 10 years service Klotz maintains that this opinion is erroneous, that in most instances strumous buboes are simply the consequence of an infection with some septic matter, probably cocci, and that they occur as a rule in individuals who have enjoyed perfect health and sound constitution before they became infected, and do so again after they are relieved of the bubo. Whenever they develop on a patient previously affected

with syphilis or tuberculosis they do not show any peculiarities from other cases, and are not affected by any specific treatment. They make their appearance after very slight lesions of the genital region, or from herpes, eczema, or simple abrasions of the skin, furuncul inflammation, etc., or appear in connection with chronic gonorrhœa, but not after typical chancroid or initial lesions of syphilis. The strumous bubo differs from its origin from other buboes and its characteristic features are the following :

1. Simultaneous affection of all the ganglia of a certain group, (Auspitz, Bumstead & Taylor).
2. Early formation of miliary foci of pus in the affected glands (Culvert) and gradual coalescence into larger abscesses.
3. Early and firm attachment of the whole group to the underlaying tissues, while the skin remains movable and intact.
4. Coalescence of the whole group into one single circumscribed tumor.
5. Occurrence of thickened and enlarged lymphatic vessels.
6. Secondary affection of symmetrical groups or of other neighboring groups (femoral, iliac, hypogastric, Edmanson).
7. Early deterioration of general health with fever, etc., entirely out of proportion with the local symptoms, during the early stages.
8. Last but not least the regular and simultaneous appearance of all the symptoms just enumerated.

It seems therefore appropriate to designate such buboes by a different name, as *septic aggregated bubo* or *septic bubo en groupe*, and reserve that of strumous bubo to the rare cases which are really of tuberculous nature.

Treatment of the swollen glands with the usual methods (ice, poultices, mercury, parenchymatous injections of carbolic acid, etc.) almost always proved ineffectual, and in spite of it the tumor continued to grow, resulting in destruction of the whole mass, leaving fistulae, etc., as are found described in the books. To avoid all these consequences K., who found the miliary abscesses already in glands of the size of a large pea with hardly noticable swelling and perfect indolence, strongly recommends the extirpation of the entire affected group as early as

possible, assuring a smaller tumor, a less severe operation, an early recovery and an insignificant scar, while all the disadvantages increase with time. The greatest difficulty about the operation itself is caused by the proximity of the large veins, particularly of the vena saphtena magna, which may be found closely attached to or completely imbedded into the mass of the glandular tumor, or may show irregularities (v. ANNALS Jan. 1887). The wounds from the operation in cases without complication usually healed in 4 to 6 weeks, or less after very early extirpation, and patients rapidly regained their usual strength and health. Gangrene of the scrotum never occurred; œdema, however, of the scrotum and of the extremity were observed occasionally. Erysipelas followed in a number of cases, but only once led to a fatal issue. Another death occurred from secondary hæmorrhage from the femoral vein, which had been corroded by a strong solution of chloride of zinc. In both cases death could not be attributed to the operation directly.—*Berlin klin. Wochenschrift*, 1890, Nos. 6-8.

AUTHOR'S ABSTRACT.

GENITO-URINARY ORGANS.

Urinary, Urethral, or Catheter Fever. By C. G. BUCHANAN KLOPHEL, M.D. (Rochester, N. Y.). The author concludes a comprehensive paper as follows:

1. In operations for the relief and cure of chronic retention of urine, the complete evacuation of all the urine at first should not be permitted, but rather the withdrawal of only a few ounces, and the immediate injection of a solution of boracic acid or other mild antiseptic, in volume equal to one-half the quantity of urine withdrawn, lessening with each succeeding injection the quantity of fluid thrown in, and increasing the amount of urine withdrawn. Thus, by regular gradation the bladder is emptied, and the circulation, in its abnormal wall, is accommodated by degrees to the new order of things. The same may be said of the ureters and kidneys. As a result, we have less shock, if indeed any; no suppression of urine; no hæmorrhage from the urinary organs; and slight, if any, urine fever, so-called.

2. Tight strictures of the membranous urethra are more success-

fully, and hence more safely, dealt with by perineal section. When associated with strictures of the pendulous urethra, the combination of internal and external urethrotomy is undoubtedly the best treatment.

3. The decomposition of blood, urine, and other organic matter in the bladder or urethra, may give rise to the phenomena through the production of ptomaines; hence the necessity for antiseptic treatment, generally and locally.

4. The disease is more common among those who are predisposed to it by the nature of a peculiar nervous temperament.

5. In view of the fact that more or less shock attends all urethral operations, especially the forcible and rapid dilatation of old strictures with sounds; and as sudden death has followed even the gentle insertion of a sound, the calibre of which was less than the stricture, it is hence important that all practical precautions should be observed in every case of dilatation of a urethral stricture or strictures, with a view to avoiding, so far as possible, such effects, that unhappy sequel being more liable to follow rapid dilatation of old strictures when not preceded by internal urethrotomy.

6. It is also important to ascertain the condition of the bladder, urine and kidneys before operating for stricture of any degree, and when these two organs are found extensively diseased, the greatest skill, gentleness and patience is necessarily called for in the treatment of strictures. Further, when these organs are diseased, and we have to deal, in a given case, with several strictures of very small calibre of the pendulous urethra, two courses compatible with safety are presented, viz: gradual dilatation alone, or internal or external urethrotomy, leaving a few days between the internal and external operations, the latter being done first.

7. Quinine, in any quantity, exerts no manifest influence over the course of the disease.

8. Boracic acid, internally, by its resolvent and antiseptic action doubtless does exert a favorable influence upon the disease, and will prove a prophylactic if given some days before operating.

9. With a further view to prophylaxis, both before and after all operations upon the urethra—even simple catheterism—the canal should

be injected with some mild antiseptic. This is more essential after each act of micturition, subsequent to internal urethrotomy.

10. When urine fever persists despite all treatment, or should, after any operative interference with the urethra, jeopardize the patient's life, perineal section should certainly be done.

11. I believe the disease in some instances to be one resulting from the escape of micro-organisms into the circulation. In others it is due to the absorption of their products at the points of operation. It is probable that in some cases the absorption of these products, and those of tissue disintegration, takes place at different points throughout the genito-urinary tract. In other words, in some it may be a septicæmia, in others a sapræmia. I think, so far as our knowledge goes, we may have both acting at one time.—*Therapeutic Gazette*, March, 1890.

II. Calculus Impacted in the Ureter Removed by Operation. By G. TWYNAM (Sydney). A child, æt. 8 years, had suffered from pain in the abdomen and hæmaturia for 16 months. Sound-ing discovered no stone, and no traces of bilharzia could be found, although a large amount of blood and large mucous casts were found in the urine. Pain was felt over the pubis and at the end of the penis. The temperature varied from 97° to 100°, being subnormal when no blood was present. Six months later the pus and mucus still existed in the urine, the temperature being 104° with distinct tenderness, but no pulse in the left side, although the patient leaned to that side. A month later an exploratory incision in the left linea semilunaris discovered no stone in the left kidney or ureter, but a calculus in the right ureter, two inches from the bladder. The wound was closed and healed well. Three weeks later an incision was made, similar to that used for tying the common iliac artery, and, after some difficulty in isolating the ureters, the stone was extracted with forceps through a linear incision; it weighed 6 grains and was just the size of a No. 12 catheter. The wound in the ureter was stitched with fine silk by means of a fine-eyed needle, although very difficult of accomplishment. A drainage tube was introduced to the bottom of the cavity,

and the wound dressed with salicylic wool, but on account of urine soaking freely from the wound for the first three days, the dressings required frequent changing. Some suppuration necessitated the removal of the stitches with which the wound had been closed, and this was accompanied by severe rise in temperature for a few days. On the fifth day, however, the urine ceased to flow from the wound, which then rapidly healed, and the boy made a rapid recovery.—*London Lancet*, February 1, 1890.

JAMES E. PILCHER (U. S. Army).

III. Litholopaxy in Children. By DR. P. MORELLI. The author first discusses the most important objections urged against lithotripsy in former times, these consisting of those based upon exceeding narrowness of the urethra, the danger arising from the use of correspondingly small sized instruments, and the excessive reaction following the operation. Because of these the operation was restricted to exceptional cases in children, and lithotomy was given the preference as a means of treatment for vesical calculi. That these objections cannot be referred to the operation of litholopaxy is shown by the extraordinarily favorable results obtained by this operative procedure in this class of cases in recent times. The recent publication by Keegan of the astonishing results obtained in the Indore Hospital in the East Indies with this operation in children, whose ages ranged from 21 months to 14 years. From 1881 to 1886 he operated 58 times, with but one death arising therefrom, and up to 1888, 114 cases, with a mortality of but 3.5%.

The reasons for the great infrequency of the adoption of this operative procedure up to the present time may be comprehended as follows:

1. It is claimed that between the ages of 3 and 8 years, during which period of childhood vesical calculi occur in the young, the excessive narrowness of the urethra necessitates the employment of instruments of extremely small dimensions. An instrument with a very small beak will have its usefulness limited to the grasping of very small stones. Experience teaches, however, that the size of the

urethra in children is in no wise proportionate to the age of the child, and in addition to this there is a wide variation at this age in the distensibility of the canal. It is also a well known clinical fact that in male children the subjects of vesical calculi there occurs an abnormal development of the penis. Keegan declares that he could easily pass, in a child of 11 months, a No. 7 English lithotrite into the bladder. In children from 3 to 6 years of age he employs No. 7 and 8 English. With a lithotrite No. 8 English stones weighing from 13 to 20 gm. could be easily grasped and crushed. In children of from 8 to 10 years he employs Nos. 10 and 11, and sometimes even to No. 14. These are not such extraordinary statements as would appear at first sight; the well known fact that the children, both male and female, reach development, particularly in the case of the sexual organs, at an extraordinarily, to us, early age, should be borne in mind.

Morelli found that a No. 6 instrument passes easily through the urethra of children of 2 to 3 years of age, and answers for grasping and crushing calculi of 7 gm. in weight.

The objection made against the operation because of the small size of the prostate, the pear-shaped form and high location of the bladder in children, cannot be held as valid against the operation.

Formerly, the great sensitiveness and irritability of the mucous membrane of the bladder, and the severe local and general reaction, were greatly feared. Bigelow's assertion that it is not the pressure of the instrument, but rather that of the fragments themselves remaining in the viscus which give rise to alarming symptoms, is borne out by Keegan's experience. With this in view, the operation may be prolonged at will, so long as the entire debris is removed and no source of irritation left behind.

Finally, if instruments which, after introduction into the bladder, can be easily moved back and forth along the urethra, tearing of the mucous membrane of the latter may be avoided. Before removing the evacuating tube, a mandril or plug is passed within the latter in such a manner as to close its fenestra, thereby preventing injury to the mucous membrane of the urethra by the presence of small portions of debris which may be lodged in the same. Extreme care and gen-

teness during the entire manipulation do away with all objections on this score.

Morelli recommends that the knowledge gained by the search for stone in the bladder should not be limited to ascertaining its mere presence in the bladder, but should also include its size, as well as the capacity of the urethra.—*Giorn. intern. del. Sci. Med.*, 1889.—*Centbl. f. Chir.*, 1890, No. 6.

IV. A Simple Method of Fastening in Situ an Elastic Catheter after Perineal Section. By DR. LAUENSTEN (Hamburg). For the purpose of fixing an elastic catheter in the urethra during the first few days following perineal section for deep urethral stricture, Lauensten employs the following method: A silk thread is tied around the catheter, at a point opposite the wound in the urethra, leaving both ends of the thread sufficiently long to allow of their being passed out of the perineal wound when the catheter is passed into the bladder. The wound itself is then packed with iodoform gauze, the free ends of the threads being finally tied over the latter. This serves the double purpose of fixing the catheter in situ and retaining in place the wound dressing of iodoform gauze. In a case reported the first redressing occurred in 6 days, and the catheter was retained for 12 days. Healing per primam of the urethral wound is claimed to have taken place, except at the point where the threads passed out of the same. The perineal wound had entirely closed at the end of six weeks.—*Centbl. f. Chir.*

GEORGE R. FOWLER (Brooklyn).

V. On the Treatment of Injuries of the Urethra and Their Results. By DR. HAEGLER. Five cases of injuries of the urethra which came into the clinic of SOCIN and E. BURCKHARDT led the writer to critically and experimentally elucidate the treatment of these injuries in the recent state and the results of such a treatment. The experiments which he made upon eight dogs as to the value of the urethral suture in incised and contused wounds of the urethra place this procedure upon a firm basis. His conclusions are as follows:

1. After every extensive rupture of the urethra external urethrotomy should be done as soon as possible, the posterior end of the urethra to be sought for and the two ends at once sutured; the two edges of the wound cannot however always be closely and equally united.

2. The suture should be introduced as far as possible into the sub-mucous tissue and during the first 24-48 hours a catheter should lie in the urethra, the perineal wound not to be closed.

3. Only after a complete healing of the wound and then only should bougies be used. But if there be already callous strictures present the cicatricial masses should be excised and the ends of the urethral wound united at once.—*Deutsche Ztschr. f. Chirurgie*, Bd. xxix, Hft. 4, p. 277-310.

F. PRITCHARD (Boston).

WOUNDS, INJURIES, ACCIDENTS.

I. Skin Grafting after Thiersch's Method. By DR. IVAN I. FOMIN (St. Petersburg, Russia). The author details 18 cases (14 of callous, varicose, syphilitic, and post combustion ulcers of leg, 1 case of burn of thigh, 1 epithelioma of the forehead, 1 of the temporal region and 1 of nasal lupus), referring to 12 men, aged from 15 to 63, and 6 women, aged from 20 to 52, where he resorted to the transplantation of skin after Thiersch's rules (*Vide ANNALS OF SURGERY*, 1889, March, p. 179; April, p. 290 and May, p. 357).

In rough outlines, the author practises the method in the following manner. Given a case of crural ulcers, the latter are treated with warming compresses soaked in a weak (1 to 5,000) solution of corrosive sublimate, until a complete cleansing of the granulating surface has been obtained (which takes place in from 3 to 7 days). On the day of the operation, the whole limb is washed out with soap and some antiseptic lotion, after which a syringeful of a 4 % solution of cocaine is injected into the neighborhood of the ulcer and the latter carefully scraped out with a sharp spoon down to the fascia or muscles, any calous edges being pared with a knife. The procedure over, a compressing bandage is applied to arrest all hæmorrhage (which takes from $\frac{1}{2}$ to 2 hours time). The next step consists in slicing off (by

means of a razor) thin cutaneous strips measuring from 12 to 15 cm. in length and 4 in breadth. The author usually cuts them out of the patient's arm (previously duly disinfected). Having moistened the slice with a 1 % solution of carbolic acid, he transfers it on the razor to the ulcer, until the whole area has been covered in such way that no exposed surface whatever has been left, the cuts of the strips overlaying (about $\frac{1}{2}$ cent.) the edges of the wound. Then the adjusted grafts are dried out with cotton wool pellets, powdered with a thin layer of iodoform and covered with strips of fenestrated protective tissue placed perpendicularly to the cutaneous slices and overlapping each other in a tile-like fashion, the whole being covered with an antiseptic dressing and the limb immobilised. The slicing procedure is made painless by a hypodermic injection of a syringeful of the cocaine solution. The wounds left by it heal in from 7 to 10 days. The results obtained by Dr. Fomin are invariably brilliant; even most extensive and obstinate ulcers soundly heal in a few weeks or a couple of months.—*Vratch*, No. 11, 1890, p. 249.

II. Traumatic Hæmatoma of Major Labium. By DR. SERGHEI A. KOTLOFF (Potchep, Russia). A robust peasant woman æt. 27 years pregnant three months, while trying to take a seat on a shaky heavy block, was struck by the latter on her left major labium. On examination, the labium was found transformed into a very painful, bluish red, fluctuating, elastic tumor having the size of a big male fist and extending from the pubes down to the perineum. On the third day, the blood cyst spontaneously burst on its inner surface. The cavity gradually contracted, to completely heal in 3 weeks. The treatment consisted in rest, corrosive sublimate irrigations and iodoform dressing—*Letopis Khirürgitcheskaho Obshtchesva v' Moskvæ*, January 1890, p. 42.

VALERIUS IDELSON (Berne).

III. Wound of Female Genitals. By Dr. N. A. DOLGOPOLOFF (Kursk, Russia). A peasant woman, æt. 43 years, fell from the roof of her (low) hut to strike astride a hedge below. When seen

shortly afterwards, she had facies hippocratica with small and slow pulse. On the right major labium there was found a lacerated wound freely admitting a forefinger which could pass up about 7 ctm., along the lateral wall of the vagina and nearly as much along a pouch deviating from the former in direction towards the mons veneris. The edges of the laceration were intensely crushed and œdematous. There was also present incontinence of urine caused by contusion of the urethra and vesical cervix. The wound was plugged with gauze and dressed, and stimulants administered internally. A good recovery ensued — *Letopis Khirurgitcheskaho Obshtchestva v 'Moskve*, February, 1890, p. 120.

VALERIUS IDELSON (Berne)

NEPHRORRHAPHY.¹

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MOBILITY of the kidney exists in two varieties:
(1) Movable kidney, and (2) Floating kidney.

A sharp line of distinction is drawn between the two conditions, anatomically and morphologically.

Anatomically a floating kidney has a mesonephron formed by a reduplication of the peritoneum and, therefore, like a coil of the small intestines, lies within the peritoneal cavity.

A movable kidney lies posterior to the peritoneum and is freely movable in the retro-peritoneal space, moving either without its fatty capsule, or within this capsule.

Morphologically they are distinguished in that a floating kidney is always a congenital abnormal development, whereas a movable kidney is probably always acquired.

But however clearly we may draw the line theoretically, practically I believe the two conditions merge into each other with no sharp line of demarcation. In my own experience (which covers four operative cases) I have never seen a mesonephron during operation and yet, in two of the cases, the kidney fell easily with any change of posture into the right iliac fossa and over to the left of the middle line.

The range of motion of a movable kidney is, therefore, quite as great as could exist if it were anatomically a floating kidney; yet, from the absence of any strict mesonephron it would be classed rather as a movable kidney.

The frequency of movable kidney is certainly underrated by most surgeons. In over eleven thousand autopsies in three hospitals, quoted by Newman, only eleven cases were found. But, very naturally the condition would be overlooked, unless it were sought for; and in the dorsal position in which the au-

¹Read before the American Surgical Association, May, 1890.

topsy is always made, would naturally not be discoverable, unless displacement persisted. It is therefore much more frequently detected clinically than pathologically. For example, Skorszewsky (Morris. Dis. of the Kidney, p. 27) in 1422 patients found the condition to exist in 32 women, out of 1030 cases, and in 3 men out of 392. Drummond (*Lancet*, January 11, 1866, p. 89) has recently reported 30 cases that he himself has observed, and according to Oser, of Vienna, 10 % of the women that have borne children are so affected.

With such clinical facts before us, it is impossible to deny the existence of the malady, and, as the history of the cases shows, its gravity. It is much more frequent in women than in men. Of 290 cases collected by Newman, (Sur Dis. of the Kidney) 250 were in women, and 38 in men, about 7 to 1. Landau (Arch. f. Klin. Chir. 1879,) states that of 314 cases, 273 were in women, as against 41 in men, about the same proportion again.

The preponderance is greatly upon the right side. Of Landau's cases, 151 existed on the right side, 13 on the left, and 14 on both sides.

Causes.—Floating kidney is always a congenital affection; Newman and Morris both cite undoubted instances of the affection.

The cause of movable kidney may be a fall, a blow or other traumatism, of which a large number of cases present a clear history. That it follows and is caused by pregnancy and a consequently lax abdominal wall, is very probable in many cases but there are too many cases, both in men and unmarried women to assign to this the predominant role, as some authors do.

Moreover, the loss of fixation has sometimes been attributed to the disappearance or diminution of the peri-nephric fat, but so far as my own observation goes, in all the cases that I have operated upon, there was plenty of this fat, and in the last case reported in this paper, in which the mobility of the kidney in respiration was very great, there was an abundance of fatty tissue locally around the kidney, though the patient was a tall, spare man, and had fallen in weight from 165 to 130 pounds.

Symptoms.—Opinions as to the advisability of remedying the condition vary, from the extremes of Landau (Verhand. XI. Deutsch Chir. Congress, 1882) who thinks that operation is never justifiable, to that of Keppler (Arch. Clin. Chir, 1879, p. 520) who believes that a movable kidney is a constant menace to the life of the patient, and that nephrectomy should be performed as soon as the diagnosis is made. This diversity of opinion is based partly on the unsatisfactory results of the earlier operations, and, partly, it seems to me, on the want of appreciation of the serious annoyance, discomfort, pain and danger which a mobile kidney produces. These will be best appreciated by a glance at the table, and by reading the history of the three cases I here report.

Mr. Tait has operated upon but three cases, one of which, he writes me, ultimately died from the suppuration following the operation, and the others were not benefited in the least; and he declares (*Brit. Med. Jour.* November 16, 1889) "that he will have nothing more to do with the fixation of the kidney."

As will be seen later, the death rate of the operation is but slight, and with the improved methods that have been introduced, it ought to be lessened rather than increased. The table which is appended will show, moreover, that the results as to comfort and health have been most satisfactory in the majority of the cases. I have no doubt, therefore, myself, that the operation will prove to be a distinct advance in renal surgery.

The discomforts which arise from a movable kidney are many and decided. There is much dragging pain, with a sense of weight in the loins. Gastric disturbances are extremely common. Constipation, fetid breath, sometimes vomiting, are all noticeable. Not uncommonly there will be palpitation or other cardiac symptoms. Disturbance of the generative organs in women are very frequently associated with movable kidney, and, whether as a cause, consequence or co-incidence, it is very certain that the majority of women suffering from this disorder are of a highly neurotic constitution. The discomforts are very great, and the pain may be so excessively severe and prolonged as to interfere with all occupation, and

practically to make life almost unendurable. In women, the pain is nearly always much greater during menstruation. This pain is attributed by Dunning (*Jour. Amer. Med. Assoc.* December 19, 1885) to the traction on the capsule and renal tissue, through the vessels and ureter, and he supports his belief by experiments upon the fresh kidney. The mental annoyance, also, is by no means a slight factor in the problem.

But disturbance of the functions, discomfort and pain, are not the only afflictions which attend this condition. The disorder may pass beyond the realm of bearable evils, into serious and actual danger to life itself, so that in considering the slight mortality from nephrorrhaphy, we must also bear in mind that there is a mortality attending the expectant plan as well. Thus Berry (*New Orleans Med. & Surg. Jour.* 1889-1890, n. s. xvii, p. 18) records the case of a patient who died six weeks after the discovery of the floating kidney. He attributes the fatal result to rupture of an abscess of a kidney, or of a ureter. Schütze mentions three cases as fatal, without operation, though it is not clear that the deaths were really due to the kidney. Newman also calls attention to intermittent hydro-nephrosis as a result in four cases of the 21 observed by him, while in 5 albuminuria was present, and in 3 jaundice. Köhler (*Charité Annalen* xiv. Jahrgang, 1889, 593) and Hahn (see table case 59) and Guyon (case No, 78) report three cases of hydro-nephrosis, and Thornton (*loc cit.*) a case of double hydro-nephrosis from the same cause. Not long since (*Med. News*, May 3, 1890) I was obliged to perform nephrectomy for hydronephrosis arising from movable kidney. Thornton (*Surgery of the Kidneys*, p. 11) and Newman (*Sur. Kidneys*. pp. 48-51) state also that torsion of the ureter may give rise to uræmia.

Diagnosis.—The diagnosis of movable or floating kidney is in general pretty easily made, but the disorder not uncommonly escapes attention, at least for a time, because the condition is not sought for.

Given a movable tumor in the flank, which can be displaced into the iliac fossa, or up to, or even beyond the middle line, which can be pushed back into the position of the kidney, and which has about the shape and size of a kidney, and the diagnosis is clear. Tumors of the omentum, or of the mesentery

are the most likely to be confounded with it. One very remarkable case is mentioned by Mr. Morris in his *Treatise on the Surgical Diseases of the Kidney*, p. 35.

In the appended table there are two cases (Nos. 48 and 99) in which a distended gall-bladder was present, as well as a movable kidney. In Mear's case (99) cholecystotomy was done by the lumbar incision, and in v. Tirchendorf's (48) the same operation (by which incision is not stated).

Mr. Lawson Tait has also reported a case of distended gall-bladder which had been mistaken for floating kidney by several distinguished authorities. (*Brit. Med. Jour.*, Nov. 18, 1882). Dr. Lindsey Stevens has also recorded a case of floating kidney with distended gall-bladder and calculi.

Percussion of the loin will sometimes assist, although this is not to be implicitly relied upon. At best, the limits of the renal dulness are not any too well defined when the kidney is in place; and the tympanitic sound discovered when the kidney has fallen forward or downward, is not so clearly marked as to render it a thoroughly reliable symptom. The resistance to bi-manual examination afforded by the presence of the kidney, and the absence of this resistance when the kidney is displaced, is a much more reliable symptom. The bi-manual examination is best made if the abdominal hand takes advantage of expiration to depress the abdominal wall, retains the advantage so gained during the next inspiration, and follows it up by still further depression during the following expiration. The legs should be flexed to relax the abdominal wall.

The size and shape of the tumor is a reasonable guide and sometimes, though not frequently, the hilum can be made out, and the pulsation of the renal artery felt.

Of course an examination of the uterus and ovaries should be made, so as to determine any possible connection of such abdominal tumor with the generative organs. That this is no needless precaution is seen from the statement of McCosh, that in two cases dilatation of the uterine canal and removal of the ovaries had been done.

The urine is generally normal, though not uncommonly it

may contain albumin. If the albuminuria is persistent, it is generally due to other causes.

Treatment.—The treatment of movable kidney may be threefold.

1. *By a bandage and pad.*—In not a few cases this will answer, and should always, if possible, be tried before any operative procedures are undertaken. Of the various pads devised, the inflatable rubber one of Dunning (*West. Med. Rep.*, Oct., 1888) and of Newman seems to me the best, though I have had no personal experience in its use. Repeated pregnancies have been known to fix the kidney, probably as a result of pressure. Simple recumbency, as advocated by Landau, can scarcely commend itself to any but those of a more hopeful temperament than the majority of either patients or surgeons.

2. *Nephrectomy.*—In a few cases this is certainly justifiable, as, for example, when the kidney cannot be forced back into its proper position, as in Polk's well known case where the kidney occupied the iliac region and, though freely movable, could not be pushed from the iliac fossa into the loin. Unfortunately this was the only kidney the patient had, yet she lived 11 days without secreting any urine whatever.

Again, it is a justifiable operation when the kidney is diseased as well as movable, but this is rather because of the disease than of the mobility.

Again, it is justifiable in certain cases where nephrorrhaphy has failed, and where the symptoms are of sufficient gravity to render so serious an operation as nephrectomy, allowable. But in such cases it would be far better, as has been done by a number of operators, (see table) that nephrorrhaphy should be repeated before nephrectomy should be considered, as the mortality from nephrectomy for movable kidney is large. Thus, Newman tabulates 30 nephrectomies for movable kidney, with 9 deaths—a mortality of 30%; while Lindner (*Wanderniere der Frauen*, p. 45) gives 9 deaths in 36 cases of nephrectomy, a mortality of 25%. The mortality from nephrorrhaphy, even though repeated, is only about 2%. Certainly then, any conservative surgeon should be unwilling to have his patient run the risk of an operation, the danger of

which is not less than 25 %, until after a trial, or even repeated trials, have been made of the less dangerous operation.

Nephrorrhaphy.—Greig Smith (Abdominal Surgery, 2d Ed., Phila., 1888, p. 496) says "that an unknown surgeon is said to have performed nephrorrhaphy prior to 1870, in Mobile, Ala." Careful inquiry has convinced me that this is an error, and that the credit properly belongs to Hahn, who published his paper in the *Centralblatt f. Chir.*, 1881, p. 449, though Newman states that he himself suggested it in 1880. I have, however, included in the table the case of Dowell, of New Orleans, who fixed the kidney by a tape suture in 1874.

The operative procedure is first the usual one to expose the kidney. The patient is laid upon the sound side, and an oblique incision is made between the last rib and the crest of the ilium, beginning over the outer border of the quadratus lumborum. Rarely, if ever, will a rib have to be resected to gain room. The edge of the muscle being recognized, the perinephric fat is found immediately at its outer border. This fat having been cut or torn through, the kidney may be seen at once. If it is a movable kidney, as in the last case reported in this paper, but not displaced too far from its normal position, the movement will be seen to be synchronous with the respiration, and may be very wide in extent. In that case the kidney moved up and down with each respiration quite as freely as the liver ordinarily does. But if the kidney be far away from its normal position it will not be seen when the perinephric fat is torn through, but must be sought for, not only by the finger in the wound, but also either by the hand of the operator, or of an assistant, on the anterior abdominal wall, in order to push the kidney back toward its normal place.

At this stage of the operation, in order not needlessly to invade the peritoneal cavity, it is very important to be able to distinguish between the liver and the kidney, either of which may present itself opposite the wound. The peritoneum may be opened either intentionally or by accident. Thus Smith deliberately opened the peritoneum to determine whether the tumor was ovarian or renal in origin. Hahn accidentally opened the peritoneum, which he immediately closed by suture, and Rosenberger and Küster met with the same accident

without any ill results; and in case No. 2, reported in this paper, the same accident happened to myself. At the bottom of the wound a firm, hard, movable body was perceived, which I had every reason to believe was a kidney; but on tearing through the tissue, immediately at the bottom of the wound, I found that it was not the capsule of the kidney that I had torn as I thought, but the peritoneum, and that the firm body was the liver. Further search disclosed the fact that the kidney, which an assistant believed he was pushing back in the loin, had escaped his grasp, and was lying back in the iliac fossa. As I believed he was pushing the kidney back into the loin, I was, naturally, misled into opening the peritoneum. The opening was not large, and when the kidney was drawn up in its place it closed the opening so completely that I did not think it necessary to suture the peritoneum, nor did any ill results follow.

To avoid a similar accident in the future, however, I would suggest that in every case after tearing through the fat, so soon as the operator reaches a firm organ, which he believes may be the kidney, he should first observe its color. If it be the liver, this would be a dark brown, if the kidney, a lighter blue black. Next he should sweep his finger toward its upper border. If it be the kidney, he will very readily be able to discover the upper border by the touch; but if it be the liver, the upper border would be within the peritoneum, and beyond reach; and the comparative size of the two organs would enable him to differentiate them very quickly. The finger would readily pass below the lower border of each without giving the same differentiation. Both organs, when nephrorraphy is demanded, are movable, and therefore the effect of respiration would not enable us to distinguish them, as it would if we were dealing with a normal fixed kidney and a movable liver.

I think it also desirable that no attempt should be made by an assistant to replace the kidney by pressure through the abdominal wall until after the peri-nephric fat has been torn through. Any firm organ met with at the bottom of the wound, before the kidney is pushed back into its place, would probably be the liver rather than the kidney, if the movable

kidney is allowed to fall away from its normal position in the loin.

In doing the operation it is customary and desirable to place a pad or pillow under the patient, in order to widen the space between the twelfth rib and the crest of the ilium. But care should be taken that this pad is not so placed as to press the liver down opposite the opening in the loin, and so promote the very accident of which I have just been speaking.

In two cases I have found it difficult to push the kidney back opposite to the incision, but have succeeded in getting hold of the kidney by the following manoeuvre: An assistant steadied the kidney, which I could just touch by the tip of my finger in the iliac fossa. I then passed a tenaculum along my finger, as a guide, and harpooned the kidney by it, and drew it up to the opening. I then seized it anew with a volsella. In two cases of nephrorrhaphy and in one exploratory operation, the amount of traction on the volsella was such that the kidney substance was torn, but I never saw any ill results from it, not even any blood in the urine.

The kidney being now held in place, four methods have been used for its fixation:

As is summarized in an excellent paper by McCosh, (*N. Y. Med. Jour.*, March 15, 1890, p. 281):

1. The sutures may be passed through the adipose capsule alone.
2. They may be passed through the fibrous capsule of the kidney itself.
3. They may be passed through the parenchyma of the kidney.
4. The fibrous capsule may be stripped off the kidney, in order to obtain a raw surface of renal tissue, by means of which the adhesions, it is believed, would be firmer. The sutures are then passed through the parenchyma and capsule just inside the border of the raw surface.

In his first operation in 1871, Hahn passed the sutures through the fatty capsule only. (*loc. cit.*)

Dunning, basing his conclusion upon observations on the lower animals and in man, urges that this should be the method employed, because the attachments of the adipose capsule

are more intimate than generally supposed, and because, though intimate, they allow a normal, slight, but important respiratory movement of the kidney. If the fatty capsule alone is sutured, this normal movement is retained.

Experience has shown, however, that this means of fixation is less efficient than the third and fourth methods. In 15 cases so treated, there was failure in 4, improvement in 2, and a cure in 9 (60%).

The next step taken by Hahn, in 1881, was to pass the stitches through the fibrous capsule of the kidney itself, and this gave as a result in 27 cases, 15 cures (55.5%), improved 4, failure in 7, death in 1. But the percentage of failures was still such as to lead surgeons to seek for a still better method. The innocuousness of the operation was so assured, that greater boldness led to the third step, viz: passing the stitches not only through the capsule, but through the parenchyma of the kidney itself, first done by Delh  s in 1882 (*Verhand, XI, Deutsch Chir. Congress*, 1882). Naturally, the question would arise, to what extent the kidney would resent such traumatism, but it has been found by a large number of cases, that the presence of such sutures in the kidney substance does no harm, a fact which has been clearly demonstrated by the experiments of Bassini (*Anal. Univ. de Med. e Chir.* Milan, 1882, p. 281), Vanneufville (*Nephrorrhaphie*, Paris, 1888), and Tuffier (*Etudes exp. sur la Chir. du Rein*, Paris, 1889).

Occasionally blood has been found in the urine, but so far as my personal experience goes, it is rare. A temporary albuminuria is much more common, but it usually yields to the ordinary treatment. Experience in man therefore confirms experiment upon animals. This method has given in 59 cases cures 39 (66+%), improvement in 11, failure in 8, and 1 death.

In 1887 Lloyd (case 70) operated by a fourth method. He split the capsule and stripped it back a certain distance, so that cicatricial tissue might attach the raw kidney substance directly to the surrounding tissues, and Tuffier (*loc. cit.*) has found experimentally that such adhesions are firmer than when the smooth unbroken capsule is relied upon. The stitches, in order better to hold the kidney, should be passed through the portion of the kidney still covered with its capsule, in order to

have the advantage of its greater strength, lest they should tear out.

Five cases (Nos. 70, 90, 97, 103 and 116, 1 cured, 2 improved, 1 result doubtful, 1 failure) have been operated upon by this method. The number of cases is, as yet, insufficient to form a judgment as to its merits, but so far it is not encouraging. I have had no personal experience with it, and so far I have had good reason to be entirely satisfied with the third method, which I have adopted in all the four cases that I have operated upon. Moreover, of all these methods, we must remember that experience as yet is limited. It is certainly true that for a comparatively long time, the kidney has seemed to tolerate the presence of sutures in its substance without harm, but whether this will continue for years, whether such sutures will be a source of trouble when the degenerative changes of old age take place, whether their apparent innocuousness will give place to serious disease when the general health fails from any severe intercurrent malady, still remains to be seen.

The place where it shall be anchored should correspond nearly to the normal physiological position, but it will probably always be a little further down. If the conclusions of Dunning are correct, as I believe they are, its displacement to the lowest limit of its normal respiratory average would seem to be desirable, so as to relieve it from undue diaphragmatic pressure. Certainly I should be opposed to the method of Ceccherelli and some others of his countrymen, who have resected the twelfth, and even the eleventh rib, in order both to get more room for the operation, and to put the kidney as nearly as possible in its physiological position. The slender advantage of such a resection is certainly outweighed, in my opinion, by the great additional danger, and I should regard it as bad surgery to attempt it again. One of the four deaths that have occurred was distinctly due to wounding the pleura by this method. Stitching the kidney to the aponeurosis will hold the kidney sufficiently well and obviate any necessity for fastening it to the ribs, as was done by Duret (*Bull. Acad. Roy. de Belg.*, 1889, p. 440), and Tuffier (*loc. cit.*).

Whatever method is adopted, it is as plain as Frank has pointed out, that both extremities of the kidney should be

fixed in order that it may not be pendent from one extremity only, and so be liable to torsion and other movements. I have ordinarily passed six sutures; one at the upper end and one at the lower end, through both lips of the wound, penetrating through the kidney substance en route. Two other stitches I have usually passed between one lip of the wound and the anterior part of the kidney. A curved Hagedorn needle in Abbe's needle holder I have found to be best. The stitches should always pass through the muscular aponeurosis at the edges of the incision, in order to get a firm hold.

The question of the material for the sutures is an important one. Catgut, which was used in the earlier operations, is, I think, an improper material, and to it was due many of the early failures. Wire would certainly not answer. Gould and Norris have used kangaroo tendon successfully. Either this or silk-worm gut, or aseptic boiled silk are the best, and personally, I prefer the silk. I have used it in all my own cases and it has answered admirably.

Again, the question has arisen whether the sutures shall remain temporarily in place, or whether they shall be left permanently. I have little doubt as to the desirability of leaving them permanently, but in doing so we must remember the large number of silk ligatures that have given rise to subsequent trouble, especially in abdominal surgery. In two cases in this table (46, 53) the sutures were subsequently discharged. Hence, it is important, I think, that the silk should be as fine as possible, but thick enough to be strong.

To secure stronger adhesions Thornton (*loc. cit.*) advises that the areolar tissue be stirred up, and several drainage tubes be introduced, but I believe that the latter procedure at least is needless.

The kidney having now been fixed in place, what shall be done with the wound? Personally, I was at first disposed to close it and drain, but even the slight experience I have had leads me to believe that the best plan is to leave it open, and dress it with ordinary bichloride or double cyanide gauze. Within 24 hours I have always found that the wound, large as it seemed at the time of the operation, has been almost entirely closed by the bulging of the soft parts below the skin, and

that there has only been a superficial wound which would cicatrize in the course of ten days or two weeks. Immediate closure by buried catgut sutures to unite the muscular layers, and superficial interrupted sutures of silk for the skin (Senn case, No. 108) will also do well.

The open method secures the best possible drainage, and if the operation be an aseptic one, there should be scarcely any rise in temperature and but little discomfort.

One source of discomfort, however, I have found very marked in two cases, and Weir has alluded to the same trouble. The incision crossed the path of the ileo-hypogastric nerve, and in the cases alluded to, the patients complained of a great deal of pain in the hip and groin of the corresponding side, which I presume was due to injury of this nerve. As the nerve is entirely one of sensation, if I again find it in my path, and exposed to probable injury, I should divide and exsect two or three inches of the nerve. The local anæsthesia that would follow, I believe is of no importance, but the pain, which sometimes follows, is a serious inconvenience to those in whom it has existed.

After Treatment.—The after treatment of the wound itself is very simple, and need not vary from that which is ordinarily used for other such wounds. A more important matter is the question of recumbency after the operation, in order that the adhesions shall become firm, and not be in danger of giving way. The patient should not be allowed to sit up until at least four weeks have elapsed from the time of operation. This, I think, is ample time for the formation of reliable adhesions, but too many cases have suffered from relapse not to put the careful surgeon on his guard against the possibility of their yielding.

Should a relapse occur, a second nephrorrhaphy, and, if need be, even a third should be done before the question of nephrectomy is raised, unless there be some disease of the kidney, which would render its extirpation justifiable. Subsequent nephrectomy was done in four cases (1, 25, 66, 85).

When the patient begins to go about, a snug-fitting elastic bandage, with or without a pad, should be worn for several months, and possibly longer, so as to support the kidney in its

new position, and the patient should be on her guard against lifting heavy weights, jumping, running, dancing, gymnastics, or other violent exercise, for a year or two after the operation, lest the same violence which may have produced the difficulty should reproduce it.

Ultimate Results.—Finally, we may consider the question of the definite results achieved by the operation. Four deaths have occurred in 134 operations. On analyzing these fatal cases we find that one (No. 21) as has already been stated, was due to imprudent surgery (Ceccherelli's case), by fastening the stitches around the twelfth rib. (In one of Hahn's cases suppuration of the wound was followed by purulent pleurisy, which, however, recovered after appropriate treatment.) A second case, Hahn's (No. 83), was not due to the operation, but to an unrelieved ileus. Death occurred in two days.

A third death, that of Langenbach (No. 107), was due to an accident, as one of the stitches passed through an old embolic infarct of the kidney, which caused death from septicæmia in three days.

The fourth death, that of Mr. Tait (No. 36, 37, or 38), was due to suppuration, presumably a result of the operation. But suppuration will be a rare complication if the operation be done aseptically.

The mortality of the operation, therefore, *per se*, is at worst only about 2 or 3 per cent, which renders it one of the least dangerous operations of surgery. When we consider the serious symptoms, the frequently severe pain, or, at least, long discontinued discomfort, incapacitating the patient for the ordinary avocations of life, and not seldom resulting in hysteria, hypochondriasis, and even melancholia, it would seem that relief is purchased by but very slight risk. Moreover, as I have pointed out, the danger from hydronephrosis, if nothing be done, is very serious, and *probably even greater than that of the operation itself.

Comparing this with nephrectomy, which has given a mortality of from 25 to 30 per cent, it would seem very evident that no conscientious surgeon should recommend nephrectomy for a mobile kidney, until nephrorrhaphy has been given a fair and thorough trial.

I append to this paper a table of all the cases that have been recorded up to the present time in surgical literature, so far as I have been able to find them, and to them have been added a few cases, for which I am indebted to the courtesy of Mr. Henry Morris of London, and other friends, with three of my own cases, not before published.

The table has been prepared with great care by Dr. Thompson S. Westcott, to whom I desire to express my hearty thanks. Just after it was completed, Dr. A. J. McCosh's excellent paper appeared. I should not have published Dr. Westcott's table, but that it contains a considerable number of additional cases, and covers a somewhat larger field. It also corrects some minor errors in Dr. McCosh's paper. For example, in quoting my first case of nephrorrhaphy (No. 74 of his table) he states that the sutures were passed through the capsule only; whereas, they were passed through the parenchyma as well as through its capsule. And in Hahn's 20 cases, reported by Frank, McCosh has unintentionally introduced a new operation in surgery, that of auto-nephrorrhaphy, by giving the name of the patient as the operator—a correction which I am sure Dr. McCosh will be kind enough to accept.

SYNOPSIS OF 134 OPERATIONS FOR NEPHROURRIAPHY.

No.	Date.	Operator and Reference.	Age, Sex, Side.	Symptoms.	Operation.	Ligature.	Result.	Remarks.
1	Aug., 1874.	Dowell.—N. O. Med. & Surg. Jour., Aug., 1879.	30, F. R.	Pain in right side.	Seton for 3 months through abdominal wall and kidney.	Tape seton	I.	Repeated a year after with less relief. Became insane for two years. Subsequent nephrectomy by Dr. A. W. Snyth. Cured. Kidney found scarred from seton.
2	April 10, '81.	Hahn.—Ber in. Klin. Woch., 1889, p. 229. (vide Frank).	29, F. R. & L.	Pains in belly and legs. Two years bedridden. Gynaecological operation without success. Both kidneys moveable.	Stitched, unopened, fatty capsule of right side. Six to eight sutures.	Catgut.	Failure.	Pains soon returned and kidney found again moveable.
3	Nov. 5, '81.	"	29, F. R.		Stitched capsule pr per.	"	I.	
4	Dec. 20, '81.	"	29, F. L.		"	"	N I	Followed by pleurisy and empyema left side. May, 1884, plastic operation for hernia of kidney [which?] Chronic pneumonia. Hyss-teria.
5	April 14, '81.	"	38, F. R.	Violent oppression; severe pain in whole abdomen; often became unconscious; often bedridden, unable to work.	Stitched, unopened, fatty capsule. Six to eight sutures.	"	Failure.	Pains returned in several weeks with mobility, for which did Op. 6.
6	Sept. 22, '81.	"	"		Stitched capsule proper.	"	C.	Subsequent history unknown
7	Oct. 26, '81.	"	35, F. R.	?	"	"	C.	Well December, 1888.
8	Jan., '82.	Delhaes.—Supp. to Centbl. f. Chirg., 1882, No. 29.	? F. R.	?	Stitched through kidney substance.	"	I.	
9	'82.	Kister.—Supp. to Centbl. f. Chirg., 1882, No. 29.	?	?	Opened fatty capsule.	"	I.	Fixed after a month.
10	'82.	Esmarch.—Supp. to Centbl. f. Chirg., 1889, No. 29.	?	?	"	"	C.	Fixed after a month.
11	'82.	Luens'v. in.—Supp. to Centbl. f. Chirg., 1889, No. 29.	?	?	Stitched capsule, fatty (?).	?	N. I.	Fixed after several months. Pains still great.

12	July 27, '82.	Basini.—Centbl. f. Chirg., 1883, 4, p. 63. From Annal. Univ. di Med. e Chir. Milano, Sept. 1882, pp. 281-286.	27. F. R.	Three years standing. Gastric symptoms and pain.	Capsule opened and stitched to 12th rib. 4 sutures.	Catgut.	C.
13	Dec., '82.	Weir.—N. Y. Med. Jour., 1883, Feb. 17.	33. F. R.	Traumatic five years standing. Pain radiating to thigh and shoulder. Tender tumor. Occasional hæmaturia and metorrhagia. Repeated vomiting and nausea. Very severe pain for two years. Kidney very moveable.	Redundant fat removed and edges stitched to wound. Six or 8 sutures.	Carbolized Catgut.	C.
14	Jan. 10, '83.	Küster.—Lindner.—Ueber die Wanderniere der Frauen Berlin, 1888.	27. F. R.	?	Stitched, opened capsule and superficial substance.	Catgut & silk.	C.
15	Jan. 26, '83.	Hahn.—Loc. cit.	32. F. R.	?	Stitched capsule proper.	Catgut.	C
16	March 29, '83.	Newman.—Br. Med. Jour., April 28, 1883, p. 831.	40. F. R.	Severe vomiting, anæmia, diarrhoea. Pain in renal regions increased at menses.	Adipose capsule incised and sewed to wound eight sutures. 2 sutures through cortex & parietes secured by buttons externally.	Chronic catgut	C.
17	April 4, '83.	Svensen.—Centbl. f. Chir., 1886, 47, p. 824.	21. F. R.	Constant pain. Incapable of slightest work.	Fourteen stitches through substance	Silk.	C.
18	May, '83.	Grieg Smith.—Lancet, London, 1884, ii, 10.	39. F. R.	Tumor. Pain, mental depression, dyspepsia.	Abdominal incision. Tried to stitch subcutaneously. Substanced tore. Scratched surface and left.	None.	N. I.
19	Oct. 15, '83.	Küster.—Loc. cit.	35. F. R. & L.	Probably traumatic. Pains, marasmus. Both kidneys very moveable.	Synchronous operations. Stitches through substance	Silk and Catgut.	Tem. I.
20	Feb. 2, '84.	"	52. F. R.	Probably traumatic. 13 children Pain for 4 months. Very moveable.	Peritoneum accidentally opened. Stitches through substance.	Silk and Catgut.	C.
21	Feb. 11, '84.	Ceccherelli.—Centbl. f. Chir., 1883, 44, p. 745. Riv. clin. di Bologna, 1884, 3, S., iv, 289-316.	28. F. L.	Severe distress for years.	Stitches carried around the 12th rib.	Catgut.	D.
22	Aug. 4, '84.	Hahn.—Loc. cit.	48. F. L.	Pain, vomiting, unable to work.	Stitched capsule proper.	Silk. (?)	C.

Permanent in 1888.

After $\frac{3}{4}$ year.

Healed on 10th day. Thick gut sutures came away on 14th day. Left kidney moveable also. Kept in place by bandage.

Permanent after 3 years.

Diagnosis uncertain, therefore laparotomy. Kidney became fixed, and pain somewhat less, other symptoms unchanged.

45 hours after operation. Ataxectasis and pleural effusion of left chest.

After $4\frac{1}{2}$ years. A previous ovariectomy in 1881.

TABLE.—CONTINUED.

No.	Date.	Operator and Reference.	Age, Sex, Side.	Symptoms.	Operation.	Ligature.	Result.	Remarks.
23	Aug. 28, '84.	Hahn.—Loc. cit.	52. F. R.	Not given.	Stitched capsule proper at upper end.	Silk.	Tem. 1	Return of pains in 6 months.
24	June 12, '85.	"	"	Return of symptoms.	Stitched capsule proper.	"	1.	Renewed pains from hernia of kidney. Operation. General condition improved.
25	Oct. 10, '84.	Agnew.—Phil. Med. Times, June 13, 1885.	32. M. R.	Seven years duration, from strain. Constant pain.	Perineal fat & capsule sutured to edges of wound.	Catgut.	Failure.	Returned in 10 weeks after unusual exertion. Subsequent nephrectomy.
26	Oct. 30, '84.	Dunning.—Jour. Amer. Med. Assoc., Chicago, 1885, iv, 169-201.	44. F. R.	Strain 7 years before. Three years bedridden. Improvement followed by crisis of 9 weeks.	Stitches each side and adipose tissue. Separate stitches also.	"	1.	Kidney moveable one inch laterally.
27	Nov. 13, '84.	Braun.—Correspondenzblatt, Aertzt. Verein, f. Thüringen, 1885.	27. F. R.	Severe pain in renal region.	Stitches through fatty capsule and substance.	Silk.	C.	After a year.
28	Dec. 4, '84.	Gardner.—Aust. Med. Jour., 1885, N. S., vii, p. 153.	45. F. R.	Severe pains under right ribs and right scapula. Mother of 11 children.	2 stitches through opened capsule & 2 through substance 2 inches apart.	Chromic & Kangaroo tendon.	C.	Recovery retarded by burrowing abscess.
29	July 24, '85.	Braun.—Loc. cit.	35. F. ?	Not given.	Peritoneum opened.	?	R.	Reported very soon after operation.
30	Aug. 25, '85.	Rinne.—Schwerdtfeger, inaug. Diss. Greifswald, 1886.	41. F. R.	Associated with spinal disease. Constipation, gripping pain at micturition, irregular menses. Disturbance of sensation and motion of legs, nausea, vomiting.	7 stitches through fatty capsule & kidney.	Catgut.	1.	Kidney fast after 6 months. Bedridden from spinal disease.
31	Oct. 10, '85.	Dunning.—Jour. Am. Med. Assoc., Dec. 9, 1885.	35. F. R.	Not given.	Stitches through fatty capsule.	"	1.	Marked relief. Lateral movement of $\frac{1}{2}$ inch. Permanent 3 years after. Symptoms largely due to spinal disease.
32	Dec. 18, '85.	Hahn.—Loc. cit.	51. F. R.	Severe pain in back since menopause a year before. Obstinate constipation, pain radiating from kidney. Spinal sclerosis.	Stitched capsule proper.	Silk.	N. 1.	

33	Dec., '85.	30. F. R.	DePaoli.—Centblt. f. Chir., 1885, 51, p. 910. Gaz. de Clin. Torino., 1885, xxii, p. 108 (Warringe)	Lumbar pain, increasing digestive disturbance, bed unendurable, walking soon followed by pain and vomiting.	12th rib resected to gain room. Numerous stitches through fat and capsule to edges of wound.	Catgut. ?	C.
34	1885.	? ? R.	Svensson.—Schmidt's Jahrb., 1885, 205, p. 108 (Warringe.)	Not given.	Fastened to edges wound by ligature through kidney.	Silk.	C.
35	1883. (?)	38. M. R.	Dodd.—Lancet, Jan. 11, 1890, p. 68.	Aching pains in lumbar region and abdomen, dyspepsia, mental depression.	Not given	Not given	I.
36	Feb. 3, '86.	45. F. ?	Lawson Tait.—Br. Med. Jr., Nov. 16, 1889.	Not given.	Not detailed.	"	N. I.
37	March 8, '86.	32. F. ?	"	"	"	"	"
38	Nov. 22, '86.	23. F. ?	"	"	"	"	N. I.
39	March 30, '86.	41. F. R	Morris.—Annals of Surgery, April, 1887.	Occasional pain since 14 years. Severe dragging pain for 6 months. Tender tumor. Increased frequent micturition.	Suture through skin and subcutaneous tissue, capsule and parenchyma of upper and posterior surface.	Catgut.	C.
40	April 28, '86.	42. F. R.	Lauenstein.—Deutsch. Med. Wochenschrift, 1887, p. 508.	Continued pain in back, especially between shoulders and neck dragging on right side, stiffness of back, although weak. Weakness legs. Nausea. Impossible to sit or stand long. Uncontrollable vomiting. Loss of strength.	5 sutures through muscles and substance kidney.	"	C.
41	May 27, '86.	34. F. R.	Küster.—Loc. cit.	Two years after severe bronchitis. Intolerable pain, intestinal symptoms.	Sutures through silk and substance.	Silk and catgut.	T. I.
42	May 27, '86.	20. M. L.	Ghinozzi.—Raccogliatore Med. Forl., 1886, v. ii, 173-191.		Stitched capsule to 12th rib.	Catgut.	C.
43	June 30, '86.	56. F. ?	Morris.—Loc. cit.	Pain in loins and sickness while standing, but ceased in recumbent position.	Two gut sutures through muscle, fascia and capsule, two silk sutures through thickness wound, and kidney substance.	Catgut & silk.	C.

One of Mr. Tait's cases, 36, 47, or 38, died long after leaving his care, as he thinks, from suppuration induced by the operation.

At end of 8 months.

Recovery retarded by right pleurisy. Permanent at end of 9 months.

Recurred at end of 1886.

Commends importance and success of attachment to 12th rib.

Firmly fixed and cured permanently after 5 months.

TABLE.—CONTINUED.

No.	Date.	Age, Sex, Side.	Operator and Reference.	Symptoms.	Operation.	Ligature.	Result.	Remarks.
44	July, '86.	?	F. R. Dunning.—West. Med. Reporter, 1886.	Frequent attacks of intense pain, dragging sensation, persistent vomiting.	Stitched, moveable perirenal cellular adipose tissue to edges of incision.	Silk and catgut.	C.	After two years.
45	Aug. 4, '86.	26.	F. R. Küster.—Loc. cit.	Pain for 5 years, especially while walking. Dysmenorrhea, gynecological complaints.	Stitched through substance.	Catgut.	N. I.	Cured by subsequent gynecology. Op. Sept., 1886.
46	Oct. 2, '86.	34.	F. R. Stonham.—Lancet, 1888, ii, 109.	Cramps, pain in movement, incapacity for work.	Sutures through deep structures of wound and perinephric fat and capsule.	Silk.	C.	Abscess 3 months after in cicatrix, with discharge of deep silk suture. Permanent relief 6 months after.
47	Autumn, '86.	35.	F. R. Hahn.—Loc. cit.	Not given.	Stitched capsule perirenal.	"	C.	After 3 years.
48	1886.	?	F. R. Von Tischendorf.—Sitzungsber der Chir. Cong. Allen, 1887.	"	Done during an operation (abdominal?) for gallstones.	Not given	C.	Freed from pain.
49	Jan. 29, '87.	25.	F. R. Morris.—Personal communication.	"	Filuro-fatty capsule drawn up into wound, cut short and stitched to edges of wound by four sutures. Wound granulated.	Catgut & silk.	C.	Some subsequent loosening. Organ easily and painlessly retained by pad and belt. Leads a very active life.
50	Feb. 15, '87.	85.	F. R. Turgard.—Bul. Med. du Nord. Lille., 1887, xxvi, 334.	Traumatic 4 years. Menstrual disturbance, increased after 2 years. Sudden recurrence. Bedridden at menses, bilious vomiting, great pain in loin.	Stitched, unopened fatty capsule.	Carbolized silk	Tem. I.	Return after ten weeks. Two menst. epochs after operation free from pain.
51	April 7, '87.	40.	F. R. Morris.—Personal communication.	Not given.	Same as Case 49.	Catgut & silk.	C.	

52	April 22, '87.	46. F. R. Hahn.— <i>Loc. cit.</i>	Fall October, 1886 Then severe pains back and right leg. Obstinate constipation, epigastric pain. Morphia habit.	Stitched capsule proper.	Silk.	C.	Laparotomy February, 1887, for supposed carcinoma of intestine. Scybala. Wandering kidney found after convalescence.
53	May 6, '87.	33. F. R. Duret.— <i>Bul. Acad. Belg.</i> , 1888, v, p. 440.	Seven months duration. Gas-tralgia, diarræa, constant pain right renal region preventing standing and working. Menstrual crisis. Marasmus.	Resection 12th rib. Fatty capsule fixed with 6 sutures to wound. 7 sutures through capsule and kidney to peritoneum 11th and 12th ribs.	"	C.	Permanent after a year. One of silk sutures discharged by abscess.
54	May 11, '87.	47. F. L. Morris.— <i>Loc. cit.</i> <i>Brit. Med. Jour.</i> , Nov. 16, 1889.	Not given.	3 sutures through posterior surface, kidney $\frac{3}{4}$ inch deep, a few gut sutures in wound.	Kangaroo silk.	C.	After 7 months.
55	June 14, '87.	39. F. ? Duret.— <i>Loc. cit.</i>	Neurotic family history. Gas-tralgia 9 years. Violent abdominal pain with syncope of increasing frequency.	Same as Op. 53.	Silk.	I.	Crises less severe and kidney nearly immovable. May be atony.
56	June, '87.	24. F. R. Wilcox.— <i>Annals of Surgery</i> , 1888, vii, p. 192.	Nine years duration. Pain and dragging in tumor.	3 sutures through fatty capsule and lips of wound. Loose coaptation.	Heavy catgut.	C.	
57	Sept. 22, '87.	36. F. R. Richardson.— <i>Bost. Med. Jour.</i> June 13, 1888.	Intense pain with movement of tumor. Unable to work.	4 stitches through capsule only.	Silk.	C.	Stitches removed 15th day. Permanent at present time.
58	Oct. 6, '87.	22. F. L. Kummell.— <i>Ber. Klin. Woch.</i> , 1889, p. 34.	Epigastric pain.	Not given.	Not given	I.	Previous recovery. Nephrectomy, June, 1887, by Wiesinger. Numerous small calculi passed from dislocated left kidney subsequent to operation. Ex-cised kidney healthy.
59	Oct 11, '87.	31. F. R. Hahn.— <i>Loc. cit.</i>	Fall a year before followed by dragging in right renal region. Constipation. Morphia habit.	Stitched capsule proper. Peritoneum wounded.	Silk.	C.	Gained 41 lbs. Occasional intermittent hydronephrosis.
60	Oct. 12, '87.	36 F. L. Morris.—Personal communication.	Not given.	Same as Op. 54.	Kangaroo tendon, Silk.	C.	Stomach symptoms occasionally recur. Able to work.
61	Nov. 12, '87.	23. F. R. Hahn.— <i>Loc. cit.</i>	After dancing. Severe pain, confined to bed, vomiting, icterus.	Stitched capsule proper.	Silk.	C.	Left kidney fastened May 11, 1887. So much relieved that she returned to have right operated upon.
62	Dec. 7, '87.	47. F. R. Morris.— <i>Loc. cit.</i>	Not given.	Same as Op. 54.	Kangaroo silk.	C.	

TABLE.—CONTINUED.

No.	Date.	Operator and Reference.	Age, Sex, Side.	Symptoms.	Operation.	Ligature.	Result.	Remarks.
63		Kimmel.—Sitzungsber. d. Artz. Ver. Hamburg, 1. 25, 1887 and 8, 28, 1887.		Not given.	Sitched capsule.	Not given	Tem. 1.	Return with less suffering af- ter 6 months.
64		"		"	Stitched kidney sub- stance.	"	C.	After 1½ years.
65		"		"	"	"	C.	Fast after 1¼ years. Hys- terical manifestations.
66		"	60, F. R.	One year severe pain. Optum habit.	Stitched capsule.	"	N. 1.	Kidney remained fast but suf- fering returned after one month. Subsequent suc- cessful nephrectomy.
67		Schede.—	? F. ?	Not given.	Not given.	"	C.	Patient rides much.
68		"	"	"	"	"	N. 1.	Is hysterical. Doubtful if pains due to moveable kid- ney.
69		"	"	"	"	"	I.	Reported soon after.
70		Lloyd.—Practitioner, Sept., 1887; Centbl. f. Chir., 1888, No. 3.		"	Stripped off capsule one inch diameter & fixed denuded cor- tex by 2 deep su- tures to wound.	Stout cat- gut	C.	Also moveable liver subse- quently operated upon.
71	Feb. 3, '88.	Langenbuch.—Deut. Med. Woch., 1889, p. 385	19, F. R.	Pains in right loin.	Four deep sutures through substance	Silk.	C.	Gained 12 pounds in year.
72	April 8, '88.	Guyon.—Bul. de l'Acad. de Med., Paris, 1889, xxi, 239- 250.	54, F. R.	Pains in right loin since child- hood. Dragging often cut- ting pain right side extend- ing to pelvis. Sometimes con- tinues for weeks. Increased by exertion and menses.	Four strong sutures through capsule and superficial substance.	Catgut.	C.	
73	April 25, '88.	McCosh.—N. Y. Med. Jour., March 15, 1860.	28, F. R.	Three years. Paroxysmal pains radiating to iliac fossa, thigh and perineum. Also fixed pain. Lying in bed, standing or walking soon painful. Unable to work.	Four double sutures, the upper fastened about 12th rib, then through mus- cular fibres, trans- fixed fascia of fat- ty capsule. One suture through substance. Deep muscular sutures	"	C.	Permanent after 7 months

74	May 16, '88.	Hahn.—Loc. cit.	18. F. R.	For 3 months. After sudden pain in right renal region. Pains in abdomen. Unable to work.	Stitched capsule proper.	Silk.	C.	Fast 6 months after. Is now able to work.
75	June 4, '88.	Rosenberger.—Sitzungsber. d. Phys. Med. Gesellschaft. zu Würzburg, 1888, 123.	22. F. R.	Poor appetite and sleep. Continuous cramplike pains in abdomen.	Peritoneal cavity opened. Fat torn away so that capsule came in contact with peritoneum. 7 sutures through substance of kidney.	"	C.	
76	June 18, '88.	Lucas Championnière.—Journal de Médecine et de Chirurgie. Paris, May, 1889.	31. F. R.	For 3 years. Walking or standing impossible. Severe pain on raising right arm. Unable to earn living.	Five sutures through capsule and substance of kidney. Same as Op. 72.	Caoutchouc.	C.	After 11 months.
77	June, '88.	McCosh.—Loc. cit.	34. F. R.	Unbearable pain on raising right arm.	Same as Op. 72.	"	C.	At end of six months.
78	July 5, '88.	Guyon.—Loc. cit.	20. F. R.	Sudden appearance of painful tumor at age of 15. Tenderness, great pain, vomiting, tumor appeared from time to time, and increasing difficulty of reduction.	Same as Op. 73.	"	C.	Attributes the crises to an intermittent hydronephrosis due to constriction of ureter by malposition. Always followed by an abundant discharge of urine.
79	July 10, '88.	Gould.—Lancet, 1888, ii, 674.	28. F. R.	Three months. Frequent attacks of pain in right loin, shooting into groin and across abdomen. Increased by exertion. Sickening pain on pressure. Very painful.	2 sutures through capsule and substance and lumbar aponeur. Also deep and superficial wound sutures through substance and edges, incision. Same as Op. 80.	Kangaroo skin.	C.	
80	Previous to above.	"	R.	Return of above.	Sutures through substance and edges, incision. Same as Op. 80.	Silk.	T. I.	Returned in 3 months.
81	"	"	"	Not given.	"	Kangaroo skin.	C.	
82	Previous to Op. 79.	"	"	Return of above.	"	"	C.	
83	Summer 1888.	Hahn.—Loc. cit.	30. F. R.	Emaciation, vomiting, constipation, ileus.	Stitched capsule proper.	Silk.	D.	Two days after from unrelieved ileus. Recovery retarded by intestinal trouble.
84	Sept. 26, '88.	"	40. F. R.	Longstanding pain in abdomen.	"	"	I.	Symptoms returned and at subsequent nephrectomy kidney found fast. A minute stone at pelvis. Permanent relief after 18 months.
85	Sept., '88.	Clarke.—Brit. Med. Jour., Nov. 16, 1889.	18. F. R.	Severe pain only bearable in recumbent position.	3 sutures through substance and peritoneal covering.	"	T. I.	
86	Oct. 26, '88.	Keen.—Phila. Med. News, April 20, 1889.	35. F. R.	Following injury 18 years before. Digestive disturbances, moderate pain and constant discomfort.	7 sutures through capsule and substance.	Carbolized silk.	C.	

TABLE.—CONTINUED.

No.	Date.	Operator and Reference.	Age, Sex, Side.	Symptoms.	Operation.	Ligature.	Result.	Remarks.
87	Nov. 14, '88.	Hahn.—Loc. cit.	29. F. R.	Cramps in belly, constipation.	Sutured kidney substance.	Silk.	N. I.	Dead and dumb. Symptoms indefinite, and operation experimental.
88	Nov. 17, '88.	"	36. F. R.	Fall a year before. Dragging pain right side, only bearable lying down. Much vomiting, emaciation.	"	"	C.	
89	Nov. 28, '88.	Bryant.—N. Y. Med. Rec., Jan. 12, 1889.	28. M. R.	Nervousness, debility, nausea, anorexia, diarrhoea. Seven years standing.	3 inches of fatty capsule resected on each side and edges fastened to external wound by Dissectors fibrous capsule and passes suture through denuded surface of kidney.	Carbolized silk	C.	Also had fibrous constriction colon for which was done laparotomy, February, '88
90	Dec. 4, '88.	Tuffier.—Le Cuziat. Inaug. Dissert., Paris, 1889.	38. F. ?	Traumatism, 1882. Pain at first slight increased with time. Digestive trouble Retention urine.		Catgut.	I.	Dermoid cyst of left ovary removed February, 1889, with complete cure. Kidney fast
91	Dec. 20, '88.	Terrillon.—Bul. de l'Acad. de Med., Paris, 1889, xxi, p. 499.	42. F. L.	Four or five years. Violent and variable pains left side and renal region. Frequent syncope. Bedridden three months. Intermittent hydropnephrosis.	Sutures through capsule proper & deep structures of wound	"	C.	
92	Dec. 20, '88.	Hume.—Lancet, Jan. 11, 1890, p. 68.	31. F. R.	Movable tumor appearing in upright position. Aching pain. Mental depression	Not given.	Not given	T. I	Relapse after 6 months
93	1888.	Second.—La France Med., Sept. 21, 1889.		Not given.	"	"	C.	
94	1888.	Guernonprez.—L'Abcille Med. 1888, 44.	37. F. ?	Suffered two years.	Sutures through kidney and capsule. Same as Op. 54.	Crin de Florence Kangaroo tendon.	C.	
95	Jan. 17, '89.	Morris.—Loc. cit. Vide Br. Med. Jour., Nov. 16, 1889.	35. F. R.	Attacks of sudden abdominal pain, and cramp of abdominal muscles.	"	"	C.	
96	March 1, '89.	Morris.—Loc. cit.	37. F. R.	Not given.	Capsule proper incised and partly dissected off through which 2 sutures. Polar	Catgut.	C.	
97	March 4, '89.	Lucas Championnière.—Kholodenko. Thesis, Paris, 1889.	48. F. ?	Traumatism a year before. Pains in abdomen and loin, like uricæ colic, occurring in crisis. Smothering sensation in dorsal decubitus. Prolonged walking or standing incite spasms suffering.				

98	March 11, '89.	Terillon —Annal. de. Mal. de l'Ug., Genitourin., 1889, p. 469.	57. M.R.	Injury 7 years before. For 2 years frequent crises of abdominal pain radiating into right back and thigh, nausea and vomiting. Digestive disturbance, painful micturition at times.	For 2 Six sutures through fatty capsule only.	Catgut.	C.	After 4 months
99	March, '89.	Mears. —Trans. Am Surg. Assn., 1889.	27. F.R.	Very moveable tumor, pain in right renal region, frequent micturition, blood in urine.	Capsule incised. Sutures through substance.	"	I.	Operation exploratory. Moveable kidney found and stitched, but also a gall bladder distended from impacted calculus. Stone crushed and pushed into intestine and bladder stitched below kidney in lumbar wound. Complete cure resulted.
100	April 18, '89.	Lucas Championnière. —Loc. cit., Op. 96.	54 F.R.	For 7 years very severe pains in right flank shooting into groin. Aggravated by walking or standing.	Fatty capsule stitched with two sutures, and seven through substance.	"	I.	Complains still, but walks much better.
101	April 28, '89.	Lucas Championnière. —Loc. cit.	32. F. ?	Not given.	7 sutures through substance.	"	I.	2 months after, notable amelioration but pain not entirely relieved.
102	June 8, '89.	Morris. —Loc. cit.	38. F.R.	"	Same as Op. 54.	Kangaroo tendon.	C.	
103	Sept., '89.	Segond. —Loc. cit.	28. F.R.	Two twin and two single pregnancies in 4 years. Cannot work or lie down long.	Retracts fatty capsule, and passes through denuded kidney. Method of Tuffier.	Catgut. ?	?	Not further reported
104	Oct. 10, '89.	Keen. —Case 2, this paper.	27. F.R.	Weak back since childhood. Fell 2 years ago, and had pain in back. Attacks of epigastric pain and vomiting, painful tumor. Intermittent albuminuria.	4 sutures through parenchyma.	Boiled silk	C.	At present time permanent.
105	Nov. 19, '89.	McCosh. —Loc. cit.	27. F.R.	Gradually increasing since childhood, severe pain right side. Intervals of relief. Dyspepsia, nausea and vomiting.	7 sutures through capsule and cortex.	Catgut.	I.	On 21st day kidney slightly moveable. Operation repeated.
106	Dec. 10, '89.	"	"	"	3 sutures through substance.	Silk.	C.	After 3 months.

TABLE.—CONTINUED.

No.	Date.	Operator and Reference.	Age, Sex, Side.	Symptoms.	Operation.	Ligature.	Result.	Remarks.
107	1889.	Langenbuch. — Dept. Med. Woch., 1889, p. 325.	43. F. R.	Biliary (?) colic for 22 years Tumor in region gall-bladder.	Sutures through substance of kidney.	Silk.	D	Exploratory laparotomy for supposed tumor of gall bladder. Then lumbar nephro-rhaphy for the moveable kidney. On 3d day septi-cæmia from suture passed through old kidney infarct. Kidney fast, but prooxysms return as frequently as before.
108	Feb. 3, '90.	Senn. — Personal communication from patient's physician	42. F. R.	Duration over 12 years. Paroxysms of severe pain beginning in kidney and extending to stomach and right shoulder. Occasional traces of albumen in urine.	4 sutures through parenchyma.	"	N. I.	
109	Feb. 29, '90.	Keen. — Case 3, this paper.	31. F. R.	Malaise, loss of strength, pain in renal region, groin and thigh on slightest effort. Is an invalid.	Six sutures through parenchyma.	"	C.	
110	March 6, '90.	Keen. — Case 4, this paper.	25. M. R.	Two years duration. Excessively severe. Lancing pains. Hamaturia and albuminuria after paroxysms. Total inability to work.	Six sutures through parenchyma.	"	Probable cure	Two months after operation steadily improving in health and strength. Pains all gone.
111	May 15, '89.	Chas. B. Porter. — Personal communication.	50. F. R.	Tumor disappearing at times. "Stitches" in right side and back. Indigestion, vomiting, frequent menstruation, "fainting spells," loss of flesh.	Six sutures each in fatty and fibrous capsule.	"	C.	Permanent at present time.
112	May, '89.	McCann. — Personal communication.	34. F. R.	Pain in loin, gastric disturbance, loss of flesh.	Six sutures through parenchyma.	Silk-worm gut.	C.	
113	Oct. 8, '89.	Dennis. — Personal communication.	28. F. R.	Severe pain in right side. Dragging sensation and movement of tumor. Became bed-ridden.	Suture through parenchyma.	Not given	C.	Permanent at present time Is now able to work.
114	Oct., '89.	"	24. F. R.	Chronic invalid for years with dyspepsia and diarrhoea. Severe pain in renal region.	Suture through parenchyma.	"	I.	Pain relieved but still suffers from intestinal trouble.

115 Nov., '89.	Parkes.—Personal communication.	37. F.R.	Severe dyspepsia, emaciation, ² pain. Nausea when away from normal position. Albuminuria.	2 sutures through parenchyma	Catgut	Failure	Opposite kidney now moveable.
116 Jan., '90.	Parkes.—Personal communication.	26. F.R.	Severe dyspepsia. Emaciation. Very moveable and easily recognized tumor. Painful when out of place.	Opened capsule for 1 inch. Two sutures through edge of capsule on each side. Two sutures in long axis.	"	T. I.	Patient now says that kidney has again become moveable.
117 to 120	Clarke.—British Med. Jour., Nov. 16, 1889.					Satisfactory.	Four cases referred to incidentally.
121 to 134	Küster.—Berl. Klin. Woch., 1889. Proceedings Surg. Congress.					"	Mentions 14 cases beside the 6 reported in table.

ANALYSIS OF TABLES.

In the large table the abbreviations are as follows :

C.—Cured permanently.

I.—Improved permanently.

T. I.—Improvement lasting for a time but relapsing in a few months.

F.—Failure of fixation of kidney after a few weeks.

N. 1.—Not improved by operation, but kidney remaining fast.

In the smaller tables T. I., N. 1., and F. are classed as failures.

Of 134 cases recorded 4 died, giving a mortality of 2.98 per cent.

Of 121 cases detailed, there were after 3 months:

Cured 63.....	52 per cent
Improved 21.....	17.3 “
Failed 19.....	17.3 “

Beside these there remain unclassified

Cases reported too early, (29) and (69).....	2
Cases cured or improved by a second operation, (2), (5), (23) and (105).....	4
Imperfectly reported, (103).....	1
Died, (21), (38), (83) and (107).....	4

11

Of 15 cases treated by suture of fatty capsule only, there were:

Cured, 9.....	60 per cent.
Improved, 2.....	13.3 “
Failures, 4.....	26.6 “

Of 27 cases treated by suture through the fibrous capsule, there were:

Cured, 15.....	55.5 per cent.
Improved, 4.....	14.8 “
Failures, 7.....	25.9 “
Died, 1.....	3.7 “

Of 59 cases treated by suture through the kidney substance, there were:

Cured, 39.....	66.1 per cent.
Improved, 11.....	18.6 “
Failures, 8.....	13.5 “
Died, 1.....	1.7 “

Of 99 patients whose sex is reported, there were:

Women, 93.....	94 per cent.
Men, 6.....	6 “

Of 87 patients in whom the side affected is reported, there were:

Right, 76.....	87.4 per cent.
Left, 7.....	8. “
Both sides, 4.....	4.6 “

I have operated upon the following cases:

CASE 1.—(Trans. of the Philadelphia County Medical Society, vol. x., 1889 and *Medical News*, April 20, 1889) was a successful case of nephrorrhaphy for floating (?) kidney. Her present condition is entirely satisfactory after the lapse of 18 months.

CASE 2.—Mrs. F. M., seen May 16, 1889, æt. 27 years; 5 feet, 6 inches; weight 115 pounds; married at 19; one child 7 years old.

Three years ago she had an operation for laceration of the cervix, by Dr. W. T. Lusk, of New York, who also made a diagnosis of re-

troversion of the uterus, and movable kidney. Ever since childhood she has had a "queer feeling as if she were not right in the right loin and back." Her back was weak, especially on exertion. These symptoms became much worse since the birth of her child. Two years ago, she fell from a step-ladder while cleaning house, and was in bed several days with pain in the back. A year ago, she had an attack of excessively severe pain in the pit of the stomach attended by vomiting. While abed in this attack, she discovered a lump on the right side. A month later she had another severe attack of epigastric pain following reaching to a height. Since then there has been pain in the tumor. She has had many symptoms of acid dyspepsia, with a good deal of eructation and canker sores in the mouth. At first the tumor was very tender at times, and painful, but this has improved to some extent, since she has worn a flannel binder, as recommended by Dr. Lusk.

At Christmas, 1888, she had a severe attack of continuous pain lasting for three weeks, attended by great nervousness, which she attributed to renal trouble. Menstruation is very painful, and always attended with clots. There is no leucorrhœa.

Physical examination shows a tumor the size and shape of a kidney. Usually it lies in the right iliac fossa, but can be pressed back into the loin, and up to the umbilicus. It is moderately tender. Percussion shows a moderately tympanitic sound in the right loin.

Urine.—Sp. gr. 1024; slight amount of albumin. Her physician states that she has had albumin at different intervals.

September 16, 1889.—Present, Drs. W. J. Taylor, Girvin, Fritts and others. Chloroform was administered instead of ether on account of the intermittent albuminuria. The patient was turned well over on to her left side, and a firm pillow was placed under the abdomen. An assistant made pressure over the anterior surface of the abdomen, to push the kidney into position.

The space between the twelfth rib and the crest of the ilium was about four inches long. I made an incision about four and one-half inches long, beginning at a point two and one-half inches to the right of the middle line, running obliquely downward at about the middle of this space.

As soon as the aponeurosis was divided, the perinephric fat bulged into the opening. Tearing through this, a hard body was felt beyond. When exposed, its color aroused my suspicion as it was far darker than the kidney. Exploring downward, to my surprise, I found that it was the liver, and on seeking its lower border, I found it lay below the crest of the ilium.

With the greatest difficulty I was able to reach the kidney, which lay as far down as possible in the right iliac fossa. I was not able to reach it sufficiently well to bring it up to the incision, but having fixed it by my fingers, I was able to pass a tenaculum on them as a guide, and harpoon it. By this means I drew the kidney up into the wound and held it there. I then passed four boiled silk sutures through the aponeurosis on each side of the wound, and through the parenchyma of the kidney. These held it fixed. In this position it blocked up and closed both the small opening in the peritoneum and that of the lumbar wound.

The muscular walls of the opening were then brought together by buried cat-gut sutures, and the skin was united by silk sutures. A few strands of horse hair were introduced for drainage. An abundant sublimate dressing was then applied, and the patient put to bed in very good condition. Only two ounces of chloroform were used.

Immediately after the operation she had excessive pain at the pit of the stomach, radiating from the epigastrium to the right shoulder, with considerable belching of gas. It was so severe that her physician, Dr. Fritts, who stayed with her, administered one-half grain morphia. The pain, and vomiting which accompanied it, continued steadily for about four days; by this time her bowels, which had been greatly constipated by the morphia, were freely moved by bitartrate of potash, and as soon as this was accomplished the pain ceased. Her highest temperature slightly exceeded 100° only twice, and was down to the normal on the fourth day. On the fourth day the stitches were removed, and the wound was apparently all healed. Up to the time when her bowels were moved, I had been very anxious lest the pain and vomiting were the precursors of peritonitis caused by my unintentional opening of the peritoneum, but the low temperature, and lack of tenderness over the abdomen, and finally the relief which she obtained from the free opening of the bowels, relieved my apprehensions. The attack was similar to her other severe attacks of the gastric disturbance in the past.

On the sixth day the wound reopened, discharging a considerable amount of dark fluid, which was evidently disintegrated blood. There were probably two ounces in amount. It continued to discharge in a gradually diminishing amount, until the end of the second week. At that time it ceased, and the wound finally closed. This delay in the closure, and accumulation of blood in the wound was due undoubtedly to the failure of my attempt to secure union practically without drainage.

November 17—Three weeks having passed since the other operation, I to-day shortened the round ligaments of the uterus for the intractable retroversion. I had no trouble in finding the ligaments; there were no adhesions of the uterus, but whether there were any adhesions about the round ligaments, I do not know. Certain it is, that on the right side the ligament was drawn out with great difficulty, and required, in fact, a force almost sufficient to rupture it. The uterus was lifted into place by a sound, and at the close of the operation was supported by a suitable Albert Smith pessary. Each ligament was shortened about one and three quarter inches, and secured to the pillars of the ring by three silk sutures; the remaining slack was coiled up and laid in the wound. No reaction followed the operation, and on the seventh day the superficial stitches were removed, and the wound was well. I kept her in bed for five weeks from the first operation on the kidney. Shortly afterward she went home perfectly comfortable, though not up to her usual strength of course. I gave her careful directions, not to dance or lift heavy weights, to avoid false steps, etc., and report to me monthly for about three months, at which time I hoped to remove the pessary.

April 21, 1890.—Soon after the operation, a blind spot appeared in one eye, and, two months ago, in the other. Dr. Harlan, who examined the eyes, reports the media and fundus clear, with hypermetropia and asthenopia. Her general health is excellent, with the exception of marked nervousness. The kidney is perfectly in place, and she has not the least trouble from it. The result in general is most satisfactory.

CASE 3.—Miss T., æt 31 years, was seen February 14, 1890, Jefferson Medical College. Clerk in dry-goods store for twelve years. Has been an invalid for three years. At that time when reaching upward for a bale of goods she felt something give away in her right loin. In addition to this feeling she distinctly “heard a snap.” She has had pain there ever since. She could not even lift a light package of goods after this. Her back gives out, and very often she can hardly raise herself. Intense pain in the back and universal weakness characterize these attacks, which come on from time to time. The legs, especially the right one, seemed also to give out, and she could only walk a few steps at a time. Sometimes, when lying down, the legs would have to be flexed

After the attack, she recovered sufficiently to half do her work at the store for a short time; but was compelled soon afterward to give it up, and has lead a miserable life since.

She has had no pain on the left side; suffers constantly with severe, nervous headaches, and especially pain in her right eye.

In the summer of 1889, for the first time, she discovered a lump in the abdomen. It changes its position with her change of posture; when lying on the right side it lies under the right border of the ribs; when standing, it lies below the umbilicus, in the right iliac fossa; if she turns on the left side, it falls "sometimes with a thud, as though it stayed in the right side for a moment, and then fell." It can be pressed to the left of the middle line. It is hard, slightly tender, markedly so at one point; it is about the size, and obscurely about the shape, of the kidney. A vessel can be felt pulsating at its border, but the hilum can not be distinctly made out.

Percussion in the loin gives a slightly more tympanitic note on the right side than on the left, but this is not very marked. The tumor can be easily pressed back into the position of the right kidney.

She cannot lie on the left side without a sense of suffocation, which even awakens her from sleep. Her general health, apart from her weakness and pain, is fair. Her menstruation is somewhat irregular. Her fluctuations of feeling well and of great prostration are very sudden and unaccountable.

Operation.—In my clinic at the Jefferson Medical College Hospital, February 19, 1890. The usual lumbar incision was done. As soon as the perinephric fat was torn through the kidney was discovered without difficulty. I was able to sweep my finger around the upper border of the kidney, and, by depressing it, to see the slow, rhythmic, respiratory movement of the liver through the thin peritoneum. The kidney was not only moved with the respiration, but when the pressure by the abdominal hand was withdrawn, the kidney slipped out of place, and, also, out of sight, so that it had to be harpooned with a tenaculum before it could be brought up into the wound.

The kidney was normal both to touch and sight. It was fastened by six silk sutures, two through the anterior lip of the wound, two through the posterior, and one at each end.

After the operation her highest temperature was 99.8° , a rise of only $.2^{\circ}$, and it reached the normal on the third day. The catheter was required. She had considerable pain running from the kidney down into the right groin. She made an uninterrupted recovery within ten days, but was kept on her back for four weeks. At the time of leaving the hospital the kidney was normal in position, and very slightly tender. The wound in the loin was a cicatrix as wide as the little finger. The ovary in Douglas' cul-de-sac was only slightly tender. Her nervousness was much better; in fact nearly gone.

April 30, 1890. After returning home she had a severe intestinal attack, but on recovering from this regained her appetite and is gaining strength. The kidney is perfectly comfortable, though it is still sore. All the pains prior to operation are gone. She is able to walk about but not yet very far.

CASE IV.—A. G., referred to me by Dr. O. H. Allis, February 26, 1890.

The patient was a physician, æt. 25 years, nearly six feet tall; weight 130 lbs.; his best weight 165 lbs three years ago.

Family history negative, except that his grandfather died of phthisis. His general health was good up to two years ago, when aching began in the right loin. This, he at first thought, was muscular. Examination of the urine soon showed albumin in considerable quantity with tube casts. Basham's mixture seemed to do him good, but did not relieve the pain in the loin. A diagnosis of Bright's disease was made by two eminent physicians.

In February, 1889, he was obliged to relinquish all professional work, as any exertion, especially driving, increased the pain. There was always a tired feeling in the right loin, which often passed into a lancinating pain so severe as to cause him to take his bed. These pains radiated to the right groin, and were only relieved by hypodermatics of morphia, which was required in doses up to one grain. He had slight fever. He never passed calculi or gravel. After an attack of pain he often passed blood, but never at other times. Microscopical examination, however, has frequently showed blood in the urine, between the attacks. These attacks of pain now occur as often as once a week. No albumin is found in the urine, as a rule, except after an acute attack, when it instantly appears. His condition was so serious that unless he obtained relief it seemed certain he would succumb before long.

Prof. Holland examined the urine with the following result: Reaction alkaline; odor putrid; sp. g. 1022; quantity 40 oz.; large amount of albumin with copious deposits of oxalate of lime; pus corpuscles phosphates; granular and hyaline tube casts; urea and urates normal in amount; no sugar or bile. Diagnosis: pyelitis and Bright's disease.

On physical examination the right kidney was found to be tender even on slight pressure. No mobility of the kidney was detected. I regret to say, however, that no examination was made in various postures to determine whether the kidney was movable or not. His sufferings were so great that it did not seem possible that they could come from anything else than serious organic disease of the kidney.

Himself and his father, both physicians, as well as Dr. Allis, came to the conclusion that probably there was a calculus in the kidney; in which conclusion I concurred, as the most probable cause of the present trouble, though I thought possibly there was only a pyelitis or tubercular disease. Movable kidney did not occur to us.

I recommended that an exploratory operation be done, with a view of evacuating the pus or removing the stone (if any were present), and, secondly to examine the kidney itself, and do nephrectomy, if the conditions were such as to require it.

Operation, March 6, 1890, assisted by Drs O. H. Allis and W. J. Taylor. I used chloroform instead of ether, on account of the albuminuria. There was nothing peculiar in the operation until the kidney was reached. The moment it was discovered, it was seen to be exceedingly movable. It moved up and down, with an excursion of not less than two inches at each respiration, and it was easily displaced by pressure with the fingers. Its appearance was normal. The kidney was separated from its fatty capsule by the finger, which was passed over both its surfaces. Its pelvis as well as its substance was examined, but no stone was detected. There was no spot of unusual hardness or softness; in fact, nothing abnormal was discovered, excepting the mobility.

I seized it with a volsella at the lowest portion and made an incision into the pelvis of the kidney. The cavity of the pelvis and calices were thoroughly explored by the finger. No stone detected, nor any pus. The bleeding was free, but not at all alarming. Finding nothing to justify the removal of the kidney, I determined, in view of its mobility, to fasten it at once by means of six silk sutures—one at the upper end, and one at the lower end of the wound, two on its anterior and two on its posterior surfaces. All of these sutures were passed through the substance of the kidney. The wound was then packed with iodoform gauze, and an ample sublimate dressing applied.

After the operation, the pain was very great, requiring morphia in half grain doses, up to as much as three grains per diem. The oozing was continuous for the first four or five days, requiring two dressings daily. Considerable blood also appeared in the urine, with some small clots. The blood disappeared from the urine at the end of a week. The passage of the clots down the ureter caused severe attacks of pain, precisely like those he had suffered from previously. His temperature went as high as 103° , but fell to the normal on the twelfth day. His stomach was very irritable, and he was exceedingly weak.

On the fifth and sixth days after the operation, it appeared doubtful

whether he would recover, and it was decided to send him home, in order that he might at least die, surrounded by his friends. He was carried home by boat, with great care, and reached there without mishap. For several days it was still doubtful whether he would recover, but on the twelfth day his temperature fell to normal; the pain, though still constant and severe, was less than before, and he began to gain in strength. The dressings now had to be changed more frequently, sometimes as often as once in three hours, on account of being wet with urine.

On the twelfth day his stomach was able to bear solid food, in small amounts, and his appetite increased. His father attributed much of his pain to a malarial element in his constitution, which several times had given him trouble. Quinine relieved it to some extent.

On about the eighteenth day the wound was healing very well, and he sat up in his chair for an hour. From this time on his condition improved almost daily. He gained in strength, and soon began to walk about; his pain diminished very much, and in a month one-sixth of a grain of morphia did him as much good as one grain did just prior to the operation. At the end of six weeks the wound was entirely well. The urine was clear, with no albumin and no tube casts.

May 6, 1890. Just two months after the operation he called at my office. The wound was healed, except a pea-sized spot of granulations. For a month he has been entirely free from all pain and has taken no morphia whatever. He has gained 10 pounds in weight. This case was by far the severest in suffering and the most serious in prognosis I have ever seen. Not the health and comfort, but life, itself, was threatened. In fact death seemed only a question of time. The albumin and tube casts seem to have been due entirely to the movable kidney. Thus far the result has been most satisfactory.

RUPTURE OF MIDDLE MENINGEAL ARTERY
WITHOUT FRACTURE. LIGATURE OF
COMMON CAROTID ARTERY
FOR SECONDARY HÆM-
ORRHAGE.

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ON MARCH 12 Jos. B., æt. 28, merchant, fell from a ladder into a shaft. Height of fall, about 8 feet. When assistance, which was close at hand, reached him, he was perfectly conscious, complaining only of severe pain in the forearm. Dr. Charles Kearns, who was summoned, recognized a Colles fracture, and after dressing it sent the patient to his home, a distance of two miles from the site of the accident. At no time during a full week from the date of the fall did the patient complain of a headache, nausea, vomiting, or indeed anything indicative of head injury. He walked about the house and the streets, transacted some business; ate well, slept well, and appeared in his usual mental condition. On the morning of the eighth day, after a good night, he descended to the dining room, complaining of some headache. A cup of coffee was taken but rejected. Seeking relief in sleep, the patient lay down upon a couch, where he at once lapsed into a condition of unconsciousness from which he could not be roused.

Three hours later I saw him, in consultation with Drs. Kearns and Nickles. His breathing was stertorous and 28 per minute; pulse 40 and full; temperature normal; coma profound; conjunctival and cutaneous reflexes entirely wanting; irregular twitching and tossing movements affected the face and extremities on both sides of the body.

There was neither mono- nor hemiplegia. The right pupil was small

¹Read before the American Surgical Association, May, 1890.

and sluggish; the left dilated almost at maximum and fixed. The urine removed by catheterization had a specific gravity of 1040 and gave the sugar reaction to both Trommer's and Boettger's tests. A careful examination of the head failed to reveal evidences of trauma.

Although the clinical picture was that of cerebral compression from sub-cranial hæmorrhage, and not that of diabetic coma, the possible presence of the latter condition could not be excluded. A drop of croton oil was therefore administered for its derivative effects.

During the five hours following the first examination, the pulse had risen to 70; the temperature to 101° in the rectum. The coma remained unchanged. Respiration stertorous as before. In expiration a slight paresis of the right cheek seemed discernible to one of the consultants. It certainly was not pronounced.

Recognizing in the increasing pulse-rate and rising temperature further evidences of hæmorrhage and speedy dissolution, it was concluded to trephine over the left meningeal artery. When the scalp was shaved, it showed no trace of recent injury. It was rendered thoroughly aseptic and bandaged to prevent hæmorrhage.

A semilunar flap, with base below, was then made, its centre being just two inches behind and on a level with the external angular process. On exposing a large portion of the temporal fossa, no trace of either fracture or fissure was seen. A bluish tinge of the squamous portion of the temporal bone gave certainty of a clot underneath. The removal of a small button of bone from this point was followed by a very copious flow of dark fluid blood, on the cessation of which a clot was exposed which was too firm to be removed through the small trephine opening. This was enlarged with rongeur forceps until it measured two inches in its antero-posterior and one inch in its vertical diameter. The firmness of the clot resisted irrigation. It had to be scooped out with the finger, and measured about 6 fluidounces. The anterior and posterior boundaries of the middle cranial fossa could be readily felt, the dura being separated by an interval of more than an inch from its bony covering.

With the removal of the clot all hæmorrhage ceased. The cavity was irrigated with a mercuric solution, a small drainage tube inserted, and the wound closed.

During the operation, which was made without an anæsthetic, the dilatation of the left pupil gradually subsided, so that at its end, it was little, if any, larger than the right. The pulse had risen rapidly, and when the patient was placed in bed was 140 and very feeble.

He appeared moribund. Six hours *post operationem* consciousness

returned, the patient asking for water. In the morning, while inclined to delirium, he was rational most of the time, although quite restless. He recognized his attendants perfectly, and was able to converse in a rational manner. Pulse 114. Temperature normal. The urine removed by catheter showed a specific gravity of 1016 and was free of sugar.

The first dressing and the drainage tube were removed on the third day, when there was a slight staining of the bandage. There was primary union of the entire wound, except where the drainage tube had been. For a week thereafter the temperature did not rise over 99.5°; the pulse-rate was reduced to 90; the delirium subsided, and the patient appeared on the road to recovery. On March 28, nine days after the operation, while the patient was straining at stool, a profuse hæmorrhage supervened, saturating the dressings and bed-linen. When Dr. Nickles, who was summoned, arrived, the hæmorrhage had ceased. The dressings were changed, the sitting posture ordered to be maintained and applications of ice to the head.

March 29. Was called at 5 A.M. for recurrent hæmorrhage. On freely opening the wound, which had firmly united, and removing a large coagulum, bright arterial blood welled from its depth. Plugging with iodoform gauze failed to check it.

In the hope of reaching its source, the aperture previously made was enlarged downwards, but without avail. Plugging the cavity was again resorted to with negative results. Nothing remained but compression or ligation of the common or external carotid artery. The extreme restlessness of the patient precluded the former practice. The profuseness of the hæmorrhage made it appear possible that its source was the internal carotid. The common carotid artery was therefore exposed and included in a catgut ligature at the point of election.

Unfortunately, as the result shows, proper precautions looking towards asepticism could not be taken. The operation had to be performed at once on the blood and food stained bed. The hæmorrhage subsided as soon as the ligature was brought home. Fearing wound infection, both wounds were thoroughly irrigated and the cervical closed over a catgut strand, while the cranial wound was left open.

The patient rallied well from the loss of blood and the operation, but delirium returned and with it extreme restlessness and insomnia. Increasing doses of morphia were needed to procure sleep. Sulfonyl and the bromides were faithfully tried but found useless.

The first change of dressings was made 48 hours after the operation. Suppurative processes had been established in both wounds. On rais-

ing the scalp flap for irrigation the pulsations of the dura were plainly visible. The suppuration over the carotid appeared to be superficial. The local and general conditions could leave no question as to the existence of pyæmia. On the fifth day, with a sudden rise of temperature to 103.5° and increase of delirium, there developed an embolic pneumonia with profuse expectoration of blood, which continued for 24 hours and then gave way to purulent sputum. After continuing for 4 days this also subsided. On the tenth day the patient again seemed on the road to recovery. The temperature continued at about 100° ; the pulse at about 108, and of fair volume. The delirium was subsiding and sleep was easily, though artificially, procured. Both wounds were covered with granulations and presented a healthy appearance.

On the fifteenth day hæmorrhage supervened from the carotid at point of ligation, but subsided spontaneously for several hours. While discussing the advisability of treating it expectantly, a sudden gush of blood decided the course. With the assistance of Dr. Dandridge, the wound was rapidly opened and the bleeding vessel sought for. The ends were separated more than an inch.

The bleeding came for the most part from the distal portion of the vessel, and only with great difficulty could this be caught and retained in hæmostatic forceps. The hæmorrhage was checked, but the patient who had lost consciousness soon after the artery gave way failed to rally. He succumbed 10 hours after all bleeding had ceased. A post-mortem examination could not be obtained.

If an apology be needed for offering the record of a case in many respects similar to the more than 400 cases recorded and tabulated by Vogt, Wiessman, Jacobson and others, I beg that you will find it in some of the unusual features presented. Of all the evidences of middle meningeal extravasation, the interval of lucidity between the accident and the appearance of compression symptoms comes first in importance. This interval may be only a few minutes, it often is one or two hours but rarely as many days. Not once in twenty cases does the interval of freedom from brain symptoms last longer than forty-eight hours. Kœnig alludes briefly to a case in *which marked cerebral symptoms developed on the eighth day* and in one of Wiessman's tables (No. 171)¹ coma supervened as late as the eleventh. But this was a case of extensive com-

pound basal fracture in which the coma developed as a result of secondary hæmorrhage.

In rather an extensive search of the literature of allied cases I have found none in which, as in the case reported, a full week passed before any symptoms of intra-cranial trauma developed.

The pressure of a firm clot, and of a large fluid extravasation above the dura, may explain the long delay of symptoms. Experiment and clinical observation abundantly demonstrate the ready adaptability of the brain to moderate general compression gradually applied. It is only when the limit is passed that this makes itself manifest. The firm clot was probably the result of a hæmorrhage during the first day after the accident, whereas the fluid portion of the hæmatoma was recently extravasated, the bleeding becoming *foudroyante* when the recumbent posture was taken by the patient for the relief of headache. It is in many cases of meningeal hæmorrhage, as in idiopathic apoplexies, the severe symptoms of compression do not supervene until the patient has been placed in bed.

Another feature of the case reported is the absence of paralytic or paretic symptoms on the opposite side of the body.

In 257 cases collected by Wiessman this absence was specially noted only 16 times.

In Jacobson's 70 cases² the absence of paralysis was noted in only two.

In each case middle meningeal extravasation had taken place. In both, there was much blood beneath the scalp; and therein lies the explanation of the absence of paralysis. The course of the artery over the face, arm and leg centres readily explains the frequency of contra-lateral paralysis in these cases. Though the effects of a localized compression are felt by the cerebrum as a whole, the parts in proximity are most effected. Therefore in hæmorrhages which are partly basal the probability of paralysis of the opposite side diminishes; while that of direct pressure on the oculo-motor nerve and consequent dilatation of the pupil increases. Hutchinson³ was the first to call attention to this condition of the pupil in two cases. Its diagnostic importance in the absence of other par-

etic symptoms can hardly be overrated. In the tabulated cases of Wiessman where dilatation of the pupil existed at all, it was present twenty times on the side of the extravasation and only four times on the opposite. There need not be any concomitant paralysis of the extrinsic ocular muscles. Only four cases have been recorded in which there was either ptosis or paralysis of the external rectus.

In the case presented the dilatation of the pupil was the only evidence pointing to the side of the lesion, and in the absence of paralysis of the face or arm, led me to believe that hæmorrhage extended more to the base than is usually the case.

The trephine was accordingly applied half an inch below the point generally selected in cases of supra-dural hæmorrhage. Without "Hutchinson's pupil," operative interference in this case would have been impossible and its immediate disappearance on removal of the clot amounted to a physiological experiment.

Another feature of this case, to my knowledge not mentioned in any case hitherto reported is the glycosuria, the relations of which to disturbed circulation of the intra-cranial viscera is more readily recognized than satisfactorily explained.

Quite recently Nagel⁴ reports two cases in which the diabetes followed directly an apoplectic attack and in which it improved with the mitigation of the cerebral symptoms.

In spinal compression similar results are occasionally encountered. Baum⁵ and Scheuplein⁶ report cases of injury and disease in which the relief of compression of the cord was speedily followed by disappearance of the glycosuria.

In the case reported the urine was normal within twelve hours of the operation. Its subsidence with the disappearance of the coma, slowness of pulse, prove it to be but an evidence of compression.

Although deficient in post-mortem evidence, this I believe adds another to the small number of cases of supra-dural meningeal hæmorrhage without fracture. Fully aware that the possibility of such an occurrence has often been denied, and that Marchand⁷ voicing the opinion of the latest French surge-

ons, rejects such lesions as "not proven", the evidence in this case appears to me sufficient to warrant the view expressed.

The greater portion of the temporal and part of the zygomatic fossa were exposed; there was no trace of fracture or fissure. Digital exploration of the middle fossa from its anterior to its posterior limits and almost to the foramen spinosum was also negative in its results. The subject was young, and the skull thin-walled. Its elasticity surpassed the arterial resistance. As in other cases of this nature, the injuring force seemed so slight as to leave no evidence of damage even to the soft parts. There may of course have been a fissure of the base to the inner side of the point explored; but nothing in the clinical history warrants such an assumption.

There was no bleeding from the ear, no paralysis; and concussion symptoms, if at all present, were so slight as to form no factor in the record of the case.

Banner⁸ reports a case in which the artery was torn across just within the cranium. This I believe occurred in my patient, the extravasation continuing until the more adherent parts of the dura along the borders of the fossa were reached. Following the classification of Kroenlein,⁹ the case is one of circumscribed temporo-parietal hæmatoma.

Secondary hæmorrhage is not often mentioned as a cause of death from rupture of the middle meningeal and its appearance so late as the eighth day, as in the case reported, is certainly uncommon. In cases of penetrating gunshot and stab wounds it has developed as late as the twelfth, the eighteenth and twenty-first day. In the case reported by Gamgee¹⁰ the hæmorrhage sprang from a false aneurism; in the case of Lang,¹¹ the bleeding penetrated into the cerebrum through a punctured wound of the dura, and in the case of Alexander¹² so far as I know the latest case of secondary hæmorrhage from the meningeal recorded, the injury followed an extensive shell-fracture of the left temporal region. While these cases have only the secondary hæmorrhage in common with the one reported, together they demonstrate that the danger from this source continues longer than the caliber of the vessel would lead one to suppose.

A more important problem than that of hæmostasis rarely

presents itself for technical solution and this applies particularly to secondary hæmorrhages where impassable anatomical bounds limit the field of operation. When the secondary bleeding presented itself as a thing to be speedily met there passed before me the many methods of securing the bleeding vessel.

Direct ligation of the vessel, inclusion with the transfixed dura and plugging its osseous canal were not attempted on the principle that a man cannot be hanged until caught. When tamponing the cavity failed nothing remained but the ligation of the common carotid artery, a plan originally suggested by Fourniaux Jordan¹³ as in the first place preferable to trephining. Compression of the artery was successfully applied by Mr. Howse¹⁴ for three hours for meningeal hæmorrhage, but the comatose condition of the patient admitted such practice. In a very recent article Mr. Horsley¹⁵ recommends it in the management of intra-cranial hæmorrhages. In a restless patient, except in a hospital ward, the plan appears to me unfeasible.

From a rather careful search of the literature on the subject, I find that there are only three cases on record in which the common carotid was tied for hæmorrhage from the middle meningeal, the operators being Bentley,¹⁶ Alexander and Gamgee.

The case of Alexander already referred to was the only one followed by recovery. In Bentley's case a fatal hæmorrhage recurred on the third day. Roser's suggestion of ligating the external carotid found only one follower in Mr. Howse. This case also proved fatal.

In conclusion I would remark that although the immediate cause of death was hæmorrhage, this was but a sequel of septic infection. I am consoled in the belief that it was unavoidable. It is not often that surgical emergencies arise in which we can not obtain asepsis; but one disastrous result like this brings into strong relief how helpless we are without this greatest factor of surgical success.

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REMOVAL OF AN EIGHT OUNCE VESICAL CALCULUS BY THE SUPRAPUBIC ROUTE.

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WHILE large calculi have been found in the bladder at post-mortem examinations, and also have been removed during life, yet their frequency is not so great as to render the report of a case superfluous. Although the termination of the following case was unfortunate, the patient dying four hours after the operation, yet it is an illustration of what may be done under such circumstances as were found, and shows the possibility of the removal of extremely large calculi by the suprapubic operation.

The history of the case is, unfortunately, not as perfect as it should be; it was, however, ascertained that the patient had been a sufferer for at least four or five years with bladder trouble, and some three years ago was told by a surgeon that he had a stone in the bladder. At this time he refused to have any operation, and his sufferings continued. On May 31, I was asked to see the case by his physician, Dr. Wm. H. Bennett, who had discovered the presence of a stone in his bladder a few days previously. Mr. Z., æt. 38 years, told me he had been for several years affected with bladder trouble, and during the past few months had rapidly broken down in his general health; this was, indeed, quite evident. I made an examination and found the stone without any difficulty. An operation was advised, but from his extremely debilitated condition, a favorable result was scarcely to be anticipated.

The operation of lateral lithotomy was decided upon for several reasons. The general bad condition of the patient, the condition of the bladder, the size of the stone, which was thought to be large, but not

of such an extreme size as it was found to be, all influenced me in favor of the cutting method.

On June 2, the patient was etherized, and I made a lateral cut. Immediately upon the introduction of my finger into the bladder I was satisfied that there would be difficulty in the removal of the calculus through the perineal cut. The forceps were introduced, and an attempt to seize the stone made; this having failed after several trials, I then introduced a lithotrite, with the intention of making an attempt to crush, but was not successful in getting the stone to engage in the blades of the instrument. Further exploration with the finger convinced me that it was impossible to complete the operation by the perineal method. The size of the stone and the close attachment of its surface to the wall of the cavity rendered any further attempt useless. The patient having taken the ether fairly well, and his condition being such as to justify immediate further operation, I proceeded at once to do the supra-pubic operation. An incision was made through the abdominal walls, above the pubis, about two and a half inches long; then a staff was passed into the bladder, along the urethra; a tenaculum was thrust through the walls of the bladder, striking the staff; the bladder was now opened, cutting on the staff; introducing my finger through the incision, I immediately came in contact with the stone, which was found to be closely adherent to the cavity wall; I now with the finger carefully separated the stone from the walls of the cavity, being assisted in doing this by having the stone lifted up and steadied by the fingers of one of the assistants passed into the rectum. The calculus being free in the cavity, a pair of large stone forceps were introduced, the stone seized and extracted. The bladder cavity and wounds, both perineal and abdominal, were thoroughly washed out with warm boracic acid solution, a drainage tube was placed in the perineal and abdominal wounds, both passing into the cavity of the bladder; two stitches were passed through the abdominal walls, which closed the wound around the drainage tube. The patient was returned to bed, and came out of the ether with a fair pulse, which continued for an hour or two, when there was a change for the worse, and it was quite evident that the shock was too great for his exhausted condition to overcome, and he gradually lost ground, dying about four hours after the operation.

The stone was weighed soon after its removal, and found to be eight ounces; its greatest circumference is nine inches, and its transverse circumference is seven inches.

There are several points in connection with this case which are of special interest, and I shall briefly refer to them.

First, was the operation of attempting to remove the stone justifiable? This, I think, can only be answered in the affirmative, since it was positively certain that no other method of treatment offered any hope of relief, and without relief a fatal termination must very soon result.

On the other hand, did any operation offer any hope of relief? This, also, may be answered in the affirmative. There are on record quite a number of cases where stones of the size of this one, and even larger, have been removed by operation, and the patients have recovered. Was the procedure adopted in this case suitable, or would it have been better to have employed some other? In answering this, it may be said that the operation of lithotrity could not have been performed. The size of the calculus, while not absolutely preventing lithotrity, was certainly an unfavorable element. That which was positively against the crushing operation was the attachment of the stone to the wall of the cavity. It would have been impossible to have engaged it in the blades of the lithotrite without having done serious injury to the parts. As to the performance of lithotomy in this case—was it an unnecessary operation? My reasons for adopting this method, I have given above, and now, knowing the whole circumstances connected with the case, before and after the operation, I cannot see any reason why I would not again proceed in the same manner. When the condition of the bladder is considered, indeed it may be said that the entire normal mucous membrane, which should line the organ, was morbidly changed, and not in a state to properly perform its function, the necessity for complete and thorough drainage was imperative, and as an evidence that the drainage was best obtained by means of the perineal wound, it was found that the urine and oozing of blood all flowed out of the drainage tube which was in the perineal wound, the tube in the abdominal wound remaining perfectly dry.

A word in reference to the relation of the stone with the bladder. The stone did not lie in the bladder cavity proper, but was encysted at the lower and posterior part of the organ;

the region which would correspond to the fundus in the normal bladder. The cavity of the cyst in which the stone lay was in communication, at the time of the operation, with the cavity of the bladder. This was evident from the fact that when an instrument was passed into the bladder cavity, through the urethra, it immediately came in contact with the stone. The demonstration of the presence of a cavity, in addition to the normal bladder cavity, was quite evident after the stone was removed, by examination through the abdominal wound. The true bladder cavity, I am inclined to think, was very much changed from the normal condition. Again, the stone did not lie loose in the cavity of the cyst, but was closely attached by at least three-fourths of its surface, the remaining fourth being free and presenting toward the cavity of the bladder. The attachment of the stone to the cyst wall was very firm and required considerable force to separate it. By careful manipulation with the finger the separation was accomplished, and was very much facilitated by having the stone lifted up by the fingers in the rectum.

In conclusion, it may be remarked that the cavity of the peritoneum was not opened by the supra-pubic section. The method adopted was to cut through the abdominal walls until the layer of fat covering the bladder was reached; the finger was then used to separate this layer until the bladder came into view. A large sized staff now passed into the bladder, through the urethra, was distinctly felt by the finger in the abdominal wound. A tenaculum was passed through the walls of the bladder, and an incision was made on the staff which opened the cavity of the organ. The bladder walls were seized on each side of the incision by a pair of forceps, and the cut enlarged to a size sufficient to permit the removal of the stone.

RUPTURE OF THE RECTUM BY PETERSEN'S
COLPEURYNTER DURING AN ATTEMPT
TO PERFORM INTRA-PERITONEAL
CYSTOTOMY.

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ON MARCH 12, 1889, D. C. R., æt. 63 years, was admitted to my service at the Methodist Episcopal Hospital, with the following history: For six years he had suffered from vesical irritability and dysuria, with occasional attacks of retention of urine. Four months previous to admission a rubber catheter had been broken off in the urethra, the fragments being subsequently removed through an incision at the peno-scrotal junction.

Examination per rectum revealed a considerable enlargement of the prostate body, both in the middle and lateral lobes. A Thompson's searcher introduced into the bladder came in contact with calcareous material seemingly imbedded in the region of the left lateral lobe of the prostate.

On March 16, an attempt was made to perform intra peritoneal cystotomy after the manner of Rydigier. The rectal bag or colpeurynter of Petersen was introduced into the rectum and 8 oz. of water, by actual measure, injected therein. A similar quantity of saturated solution of boric acid was then thrown into the bladder, after thoroughly washing out this viscus with the same solution, the penis being tied with a piece of rubber to prevent the escape of the solution from the bladder.

An incision four inches long was made in the median line about half way between the umbilicus and the pubic symphysis, and the parietal layer of the peritoneum reached. As the latter was identified, a black mass was seen through its transparent structure occupying the abdominal cavity. Upon opening the peritoneum this was found to

be the rubber colpeurynter introduced into the rectum. It was at once evident that the rectal wall had given way and the bag had found its way into the abdominal cavity. It was observed that the patient, just prior to the opening of the peritoneal cavity, had exhibited signs of profound shock, this probably corresponding to the moment when the rectum gave way and the colpeurynter entered the abdominal cavity.

The rubber bag was drawn into the incision sufficiently to cleanse its exterior, and was then partially emptied by turning the stop-cock attached to the rubber tubing which projected from the anus. The fluid was carefully gathered as it escaped, and, together with what was removed from the bag upon its withdrawal, was measured and found to amount, in all, to eight ounces. Upon withdrawing the bag, it was found that a rent fully four inches in length had been made in the anterior wall of the rectum, the upper limit of which reached to the sigmoid flexure.

The abdominal cavity was thoroughly cleansed with boiled distilled water, and an attempt made to close the rent in the rectal wall. Upon emptying the bladder in order to accomplish this, it was found impossible to adjust accurately the lower margins of the rent by means of the Lembert suture. Under these circumstances, the condition of the patient becoming exceedingly unfavorable for future interference, the operation upon the bladder was abandoned and an artificial anus established by bringing the edges of the tear in the rectal wall up to the lower angle of the incision and there securing them. In accomplishing this the real cause of the rupture was found to consist in a well-marked thinning and softening of the structures of the rectum itself. It was only after many trials and the greatest care in the manipulation that the artificial anus was established, the tissues of the rectal wall giving way again and again and the silk thread tearing out under the comparatively slight tension required to hold this portion of the rectum in position.

The patient survived the operation but a few hours, never having rallied from the shock following the occurrence of the accident. A post-mortem examination revealed the condition as above described, the softened, thinned, and otherwise weakened rectal wall being especially well marked.

The points of interest in connection with this case are as follows :

1. The fact that the quantity of water used to distend the rectal colpeurynter was rather below than above the average employed by surgeons. In fact, two ounces less than the minimum quantity mentioned by leading writers as necessary to attain the object of the distension was employed in this case.

Cadge, in the course of a discussion on supra-pubic lithotomy before the Royal Med. and Chir. Soc., at the meeting of March 30, 1886,¹ relates a case in which he introduced 18 ounces of fluid in the rectal bag, for the purposes of a supra-pubic lithotomy. When the bag was removed from the rectum a teaspoonful of blood followed, and then Cadge's suspicions were aroused. The patient went on very well for the first few days, when symptoms of suppression of urine arose. The patient died and at the autopsy it was found that a rupture of the upper part of the rectum, between it and the bladder wall, had taken place. Advanced renal disease was also present.

M. Nicaise, at a meeting of the Soc. de Chir., Paris, October 3, 1888,² relates the following case: Patient, æt. 65 years, admitted for vesical calculus, which had produced chronic lesions of the urinary apparatus. Several lithotrities had been performed without relief, supra-pubic lithotomy was decided upon. Operation apparently successful for first 8 days, when vague and indefinite symptoms occurred. Death took place on the 15th day following the operation, without any evidence of peritonitis or other complication to account for the lethal exit. At the autopsy a rupture of the anterior wall of the rectum was found. This did not extend into the peritoneal cavity or bladder. There was considerable induration of the recto-vesical region corresponding to the site of the rupture. The rectal bag had been filled with $10\frac{1}{2}$ ounces of water and the bladder had been distended with $8\frac{1}{2}$ ounces of fluid.

2. The condition of the rectal wall is worthy of attention. There can be no question concerning the resistance to rupture which the rectal wall offers under normal conditions. But the

¹Proc. of Royal Med. and Chir. Soc., London, p. 97. Also quoted by Hacke in Dict. Encylop. d. Sc. Med., 1889.

²La Semaine Medicale, Paris, 1888, p. 387.

altered conditions incident to senility, combined with the degenerative change which the surrounding parts are known to undergo in chronic vesical disease, are precisely of a character to favor the occurrence of the accident under consideration. In the case herewith reported this was strikingly illustrated by the circumstances attending the rupture and the state in which the rectal wall was found, both at the operation and the autopsy.¹

It may likewise be suggested that the particular operative procedure attempted, namely, intra-peritoneal cystomy, may have contributed to the occurrence of the accident; the support which the rectal walls receive from intra-abdominal pressure being lessened by the incision in the walls of the abdomen.

There are only two recorded instances of rupture of the rectum, prior to my own, occurring during an attempt to perform supra-pubic opening of the bladder. There are several references made to other cases, but these cannot be authenticated. Prof. Keyes, of New York,² quotes the case of Nicaise and then remarks that 4 or 5 other instances of this accident have occurred in France. It has been impossible to find any other reference to these cases except in the course of some remarks by M. Th. Anger, in the discussion upon M. Nicaise's paper, above referred to, and which is reported in connection with the latter. Mr. Anger says: "The case of M. Nicaise is the 4th or 5th of the same kind; I have therefore rejected the use of Petersen's balloon." A most thorough and extended search in the library of the Surgeon-General's office, including the proof-sheets of the forthcoming number of the Index Catalogue (Vol. XI.), having proved fruitless, I am forced to conclude that either M. Anger has not been properly reported, or else the cases which he referred to had come to his knowledge through channels other than the ordinary ones of information through publication.

¹M. Le Dentu, in the discussion of Nicaise's paper advances the opinion that alterations in the rectum by disease are the cause of the rupture.

²Annual of Universal Medical Sciences, 1888, Section C., p. 27, Article. "Genito-Urinary Surgical Diseases."

The same kind of hearsay evidence seems to have been accepted by no less an authority than Sir Henry Thompson. In the article, "On the Supra-pubic Operation for Opening the Bladder," he makes use of the following language:¹

"First, in regard to the rectal distending bag. It has hitherto been made of a spheroidal or pyriform outline, and some operators, *it is said*, have, in emptying it, burst or seriously injured the rectum."

A further detail of facts in these cases, such, for instance, as those relating to the amount of fluid employed in distending the rectal bag, together with the condition of the rectal wall, would have been of incalculable importance in clearing up the question as to the dangers to be apprehended in the employment of this device. Two facts are undeniable: First, the advantages which the supra-pubic route to the bladder affords in certain cases, and second, the almost indispensable assistance afforded by the rectal bag in overcoming the principal difficulties and dangers of the operation.

¹Brit. Med. Jour., 1886, vol. ii., p. 615.

A CASE OF FRACTURE OF THE STYLOID PRO-
CESSES OF THE ULNA AND THE RADIUS
BY INDIRECT VIOLENCE.

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A CANADIAN section laborer, æt. 24 years, rather slenderly built, but always well and strong, on July 22, 1889, while helping a fellow workman to lift one side of a handcar, weighing between 600 and 700 pounds, had, after they had together raised their side of the car, the entire weight of that side thrown suddenly and without warning onto him, by his companion's unexpectedly letting go his hold, thus giving a very violent pull to his arms from the sudden access of weight. Great pain and swelling followed in the right wrist, upon which the pull chiefly fell.

July 26, I first saw patient, and found the right wrist and arm very much swollen and discolored, and excessively painful and tender, with abnormal mobility and crepitus about the wrist. At this time accurate diagnosis was impossible, and the arm was kept at rest on a splint with evaporating lotion for a few days. Within a week the swelling had subsided sufficiently to enable me to determine that the styloid process of the ulna had been broken off near its base, forming a freely movable fragment, about the size of a man's fingertip, which when pressed against the end of the ulna gave distinct bony crepitus. There was also a distinct bony crepitus over the styloid process of the radius, due, apparently, to the tearing off of only a small scale of bone corresponding to the attachment of the external lateral ligament, and suggesting strongly the condition often found in Pott's fracture when the ruptured internal lateral ligament has detached a small thin fragment of the internal malleolus. As only a small part of the styloid process of the radius was torn off, this fracture apparently did not involve the articular surface. There was no evidence of other injury to the bones. The union of hand to arm seemed very loose, and suggested a general laceration of carpal and radio-carpal ligaments. The amount of dis-

placement was but slight, as the separated fragments were attached to ligaments, and not to muscles.

August 2, I applied a snugly fitting plaster-of-Paris roller from the metacarpo-phalangeal joints to the elbow, with wrist moderately extended and hand slightly inclined toward ulnar side to relax all tension, and compresses so adjusted as to hold the fragments closely in contact with their respective bones.

August 26, plaster removed and fragments found to be firmly united, apparently by bony union, and without any separation or deformity. Wrist was a little stiff, but ten days of passive and active movements enabled him to resume his work with a strong and useful wrist, with every prospect of complete recovery of its function.

The unusual feature in this case is the fact that the fractures resulted from *indirect* violence, the force being transmitted from the part of the hand which grasped the edge of the car through the metacarpal and carpal bones and ligaments, and through the ligaments binding the carpus to the bones of the forearm, and finally pulling off the two bony projections to which the two strongest ligaments are attached.

That *indirect* violence is a very rare cause of this injury is evident from the fact that some authorities in speaking of fracture of the styloid process of the ulna imply, at least, that it is not caused by indirect violence.

Hamilton (Fractures and Dislocations) says: "The occasional complication of a Colles' fracture with a fracture of the styloid process of the ulna has already been noticed. Much more rarely this process is broken alone, as a result of direct violence."

Agnew (Principles and Practice of Surgery) says: "Fractures of this process (styloid process of the ulna) may be produced by direct force, as when a blow is inflicted, or the patient falls upon this part of the arm: It is sometimes broken at the same time with the lower end of the radius (Colles' fracture (?)), most probably in consequence of an extreme tension of the internal lateral ligament."

A most rigid cross-examination of my patient as to the precise manner of the receipt of the injury, going even so far as to suggest that something from the car fell on his wrist, or he struck it against something, or fell on it himself, failed to elicit an admission from him that anything whatever had touched the wrist, and he always insisted that the sudden pull on his hands alone caused his injury. I, therefore, place this case on record as an instance of this injury due to *indirect* violence.

NOTE ON THE USE OF SKIN FROM PUPPIES IN SKIN-GRAFTING.

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A BOY, æt 14 years, having in April last sustained severe and extensive burns, under treatment had accomplished the healing of them all except certain granulating regions beneath the chin and lower jaw, and the right arm from elbow to fingers. Upon these surfaces skin grafts were finally placed. For the neck grafts were obtained from the arms of the father and brother of the patient, but for the arm grafts were taken from two young puppies of the Mexican hairless breed, whose soft white hairless skin seemed to offer itself for the purpose with good prospect of successful result. The result was all that could be desired. The puppy-grafts proved to be superior to the human grafts; a greater proportion of them "took," and their subsequent rate of growth was much faster.

[NOTE BY THE EDITOR.—The above use of puppy-grafts was original with the reporter of the above case, and when he communicated it he was unaware that any similar case had been recorded. In the *Lancet*, March 15, 1890, however, is reported a similar case by Mr. Alex. Milro, of Edinburg. The case is as follows:

A boy, æt. 10 years, presented an extensive ulcer on the left leg, resulting from a burn. The entire surface was covered with healthy granulations, but there was not the slightest attempt at cicatrization. It being impracticable to obtain sufficient human skin to cover the ulcers, a young black and white greyhound, seven days old, was killed with chloroform, and, the whole of his anterior abdominal wall and flanks having been shaved, the flap of the skin thus marked out was dissected up, taking the entire thickness, leaving the subcutaneous fat. The skin was cut into strips measuring six inches long by half an inch broad, which were firmly pressed into the previously cleaned ulcer in the long axis of the limb. Smaller grafts, about an inch square, were used to fill in spaces left between the larger ones. A considerable area

over the inner side of the knee still remained bare, and, to cover it, the skin from the pup's tail was dissected up, unshaven. Over these grafts an antiseptic dressing was applied.

On the first dressing, three days later, all the grafts but one small one had adhered. Some of the long strips sloughed later, but the smaller ones all did well. It was observed that the graft taken from the tail which was not shaved behaved exactly as the sponge does by promoting granulation. The hairs around the margins seemed to stimulate the granulations which grew on to the surface of the graft, and then spreading, completely swamped it. A few small grafts of human skin from a small boy were scattered here and there, two weeks later, to fill up gaps still left, and all did well. One or two spots still remaining a couple of days later were covered with pieces of the skin of an old frog, but these failed to unite.

Cicatrization was complete in six weeks after the first application of grafts. Seven months later there was absolutely no cicatricial contraction except where the tail skin was planted, and there it was very slight. The color of the skin was uniform and very similar to that of the normal skin. There was no evidence of any development of hair or of cutaneous secretions. The ordinary sensation was as good as in the other leg, and the temperature of both was the same.

The author believes the favorable outcome of the case to be mainly due to the age of the animal selected to furnish the grafts. In the first few days of extra-uterine life the creature grows very rapidly, and by grafting a large area of young tissue with a potentially great developmental power, the ulcerated area is quickly covered in and the contraction prevented which invariably results after extensive burns when they are allowed to heal without artificial aid.]

EDITORIAL ARTICLES.

OPERATIONS FOR THE RADICAL CURE OF HERNIA IN HAMBURG.¹

The radical cure of hernia by operation has within the last fifteen years been a question of great interest, and seems to have been steadily gaining ground, for, as statistics multiply, it is shown that the operation, under strict antiseptic precautions, is not very dangerous, and the number of cases increases where many years after the operation the cure is yet permanent.

Strict rules have not yet been formulated as to which cases should be operated on and which left alone, and it has not yet been determined why some cases are successful and others unsuccessful. The reason why is extremely difficult to find out, for it is extremely difficult to decide if the reason for failure lies with the patient's general condition, or in his conduct after the operation, or in the methods employed.

The writer has collected statistics of 387 cases of hernia operated on in Hamburg between 1880 and 1888. In these cases there were 72 deaths, and he tabulates the cases as follows:

Hernia operations, without further description,	cured 61,	died, 18.
Herniotomy, no mention of radical cure,	" 95,	" 21.
Herniotomy combined with radical cure,	" 100,	" 25.
Radical operation for non-strangulated hernia,	" 57,	" 2.
Herniotomy and resection of intestine,	" 2,	" 6

Of these 387 cases, in only 165 could distinct histories of radical operation be found. These cases were as follows: 51 incarcerated and 40 non-incarcerated inguinal herniæ, of the latter three were double; 64

¹By DR. FREDRICK WOLTER (Hamburg,) *Volkmann's Saml. klin. Vorträge*, No. 360.

incarcerated and 10 non-incarcerated femoral herniæ, a total of 165 operations on 162 patients.

Of the 88 patients with inguinal hernia, 79 were males and 9 were females. Of the 74 patients with femoral hernia, 70 were females and 4 males; 95 hernias occurred on the right side of the body and 67 on the left.

The operations were as follows: In 95 cases after tying the neck of the sac as high as possible, the sac was extirpated and the abdominal ring sutured. In only 17 cases the sac was tied and extirpated without closure of the ring (of these 15 were femoral hernias). In 15 cases suture of the ring alone was put down in the history, but probably the sac had been tied and extirpated. In only 3 cases was the inguinal canal slit open. In 11 cases there was some modification of the above method of operation, but no description given, and in 24 cases the method of operation was not described, only a note of radical operation being put in the history.

In 53 cases the omentum was tied with cat-gut, cut off, and the stump returned to the abdominal cavity.

The hernial sac was generally completely removed after the neck had been tied as high as possible with a cat-gut ligature; only in cases of congenital inguinal hernia, where the elements of the cord were spread over the sac and could not be dissected away, was a partial extirpation done. The testicle and spermatic cord were always carefully preserved. In only one case was the vas deferens cut and it was immediately sewn up again.

As a rule the ring was sewn up, and in the 74 femoral herniæ in only 11 cases it was not attempted, while only twice in the inguinal herniæ, or not sutured 7 times in 165 cases. Catgut and silk had always been used as suture material for this purpose till the spring of 1887, when Schede substituted silver wire, twisting it in place. This wire at first was removed during the process of cicatrization, but later on it was left imbedded in the wound.

Drainage was used as little as possible, and after a time was almost completely abandoned, the tissues being so brought together by No. 1 catgut that no hole or dead cavity remained. The skin wound w

closed by a continuous suture of No. 1 catgut. The healing of the wound occurred without any reaction in 41% of the incarcerated herniæ, and in 35% of the non-incarcerated cases. In all other cases it was disturbed in some way, either by retention of secretions (13 cases), suppuration of the suture track (10 cases), sloughing of the tissues (16 cases), eczema due to bichloride (4 cases), transient swelling of the scrotum (6 cases), infiltration along the spermatic cord (1 case), inflammation of the omental stump (2 cases), delirium tremens (2 cases), extravasation of blood in scrotum (1 case), and in 2 cases it was necessary to remove the wire sutures.

Serious complications occurred only 7 times and were as follows: Followed by cure, 3 cases; once phlegmonic inflammation of the wound, twice phlegmon of the abdominal wall. Followed by death, 4 cases; phlegmon of abdominal wall, 1 case; peritonitis following the operation, 3 cases.

The main point in the treatment of the wound after a radical operation is to obtain a complete primary union, not only of the skin, but of the wounded surfaces made by extirpation of the sac, together with a closure of the hernial exit. By abandoning drainage in these cases, the healing of the wound was much simplified and shortened. The danger of septic infection is not very great, as it only occurred 7 times in 165 cases, or a percentage of 4.24.

Sepsis is more frequent after inguinal than femoral herniotomies, and is easily explained by the more complicated nature of the former wound. The time before complete healing of the wound took place was only stated in 85 cases, and the average time of healing of 10 incarcerated hernias was 20 days. Socin, in 1881, places it at 21 days; in non-incarcerated cases, 21 days. Tilanus, in 1869, places it at 30 days; Socin 31, and Leissink 21 days; Anderegg, in 1886, found that in 136 radical operations done at Socin's clinic, the average time for complete healing, when no disturbances occurred, varied between 14 and 16 days, but where there were complications occasioned by casting off the ligatures, the time was 35 days.

Mortality.—In his mortality statistics Dr. Wolter separates the cases into those where death directly followed the operation from those

in which it was entirely independent but occurred either as a result of the strangulation or of an intercurrent disease. Further, he separates the simple from the strangulated, and the inguinal from the femoral.

Of the strangulated inguinal herniæ treated by operation 7 died; of these, 3 from infection starting in the wound and traveling to the peritoneum; one died of shock, a man, æt. 69 years, with an enormous scrotal hernia of year's standing, which contained the cœcum, all of the colon, and a coil of small intestine. Dr. Schede is of the opinion that the radical operation should not be done in such cases, but that the constriction alone should be relieved, and that the attempt at radical operation in this case was the cause of death. The three (3) other deaths cannot be attributed to the operation, for in 2 death occurred once on the 10th day, and once in the 8th week after complete cicatrization. They occurred in a man, æt. 61 years, and a woman, æt. 80 years, and was due in each case to exhaustion following a prolonged period of rest in bed.

In the third case, a man, æt. 44 years, died 3 days after the operation from intoxication due to retention of fæces, caused by intestinal paralysis. If these three deaths be left out, we have a mortality of 4 in 51 herniotomies, or a death-rate of 7.8%.

According to Leissink's statistics (1883) the mortality following 103 operations for incarcerated hernia was $6\frac{1}{5}\%$ as a direct result of the operation, 4% as a result of the strangulation, and 4% from other causes. In the 64 radical operations for strangulated femoral hernia reported by Wolter, 4 patients died; 2 old women æt. respectively 68 and 69 years, from exhaustion; one woman, æt. 68 years, died on the ninth day after operation from pneumonia and bronchitis; and one man, æt. 61 years, 19 days after complete cicatrization from hæmorrhage due to cancer of the stomach, so that none of these deaths can be attributed to the operation.

According to Leissink, in the 77 cases operated on at Socin's clinic for strangulated hernia, $5\frac{1}{5}\%$ died of sepsis or other sequelæ of the operation, $9\frac{1}{3}\%$ died as a result of the strangulation, and 8% from other causes.

Of special interest are the causes of death after the radical operation for non-strangulated herniæ, as here the patients are supposed to be otherwise healthy. There were 40 radical operations on 3 patients for non-strangulated inguinal hernia done at Schede's clinic; of these 37 patients 2 died; 1, a laborer, æt 52 years, 23 days after the operation died of heart failure; post-mortem examination showed fatty heart, and the local condition was found perfectly normal, except for slight circumscribed gangrene of the omentum with encapsulated suppuration of omental stump. The second case, a sailor, æt. 35 years, suffering from a hernia of 16 years' standing, which for a year had enlarged very much and become irreducible. The patient complained of pain and vomiting for 24 hours. The hernia was irreducible at the operation; only adherent omentum being found in the sac. On the morning of the operation the temperature was 38°C.; on the evening after the operation it was still at the same height; on the following day marked icterus and continual vomiting with no fæcal odor set in. The patient died on the 8th day from suppurative peritonitis and fatty liver; no signs of incarceration of the intestine found at the autopsy. Most probably the patient was already suffering from peritonitis when he was operated on, so the death cannot be attributed to the operation.

Of the 10 operations for non-strangulated femoral hernia all terminated happily. Of the 50 cases of non-strangulated hernia treated by radical operation there was one death, or a mortality of 2%. Tilanus (in 1879) in 79 cases placed it at 11%; Leisrink (1883), 194 cases, 10.8%, of which 7.2% as a result of the operation, and 3.6% from inter current disease; Anderegg-Socin (1886), 56 cases, 3.6%; Svensson and Erdmann (Stockholm, 1887), 116 cases, no deaths.

Result.—The primary result of the operation as the patients were discharged from the hospital was such that, with the exception of three cases, by abdominal pressure and coughing, there was no descent of the intestine or bulging at the site of the operation. The exceptions were as follows: In two cases, immediately after the operation, a protrusion of about the size of a walnut returned; and in the third case a complete reposition of the intestine could not be accomplished. All patients were given a light truss on leaving the hospital.

Definite re-ults of the operation for this it is to be determined at what time after operation a cure can be called permanent. Anderegg observed that in 105 cases, 75% of the recurrences took place within the first year after the operation. Banks states that at the end of a year a prognosis as to the definite result of the operation can be given. In the 15 cases of recurrence observed by the writer, in only 11 could the date of the return be settled, and in 10 of them it took place within the first year. According to the opinion of several writers, patients who, at the end of a year after the operation, suffer from no return, may, with great probability, be considered as cured.

Therefore of the 43 cases examined by the writer and found cured, 41 can be tabulated as follows:

Free from return at end of 2 years,	-	-	-	22.
Free from return at end of 3 years,	-	-	-	12.
Free from return at end of 4 years,	-	-	-	2.
Free from return at end of 5 years,	-	-	-	2.
Free from return at end of 8 years,	-	-	-	1.
Free from return at end of 10 years,	-	-	-	2.

Two cases were found free from return, but two years had not yet elapsed.

In the 58 cases re-examined, in 15 either an incomplete cure or a marked return was found, giving the percentage of recurrence of 25.9. Andrenchen, of Zurich, in 1881, examined 39 cases and found 50% of return. Leisrink (1883) found after non-strangulated hernia 20 ¹/₉% of recurrences, while in strangulated cases only 8 ¹/₆%. Anderegg and Socin in 1888 examined 100 cases and found recurrence in 39%. Soenson and Erdmann, of Stockholm, in 1887 examined 48 cases and found 21% of return.

The question is, in how much is the patient benefited by the operation when the result is imperfect, or when a return takes place? The question, according to the observers above mentioned, is answered in the following way: The recurrent hernia is generally small and easily kept in place by a light truss, and causes no marked disturbances. Dr. Wolter found in this respect his experience to agree with that of the other observers.

One of the most important conditions for success after the operation lies in the method employed. Numerous methods have been proposed and abandoned, but since the introduction of antiseptics, a new era has been inaugurated. Up to that time it had been thought the chief aim of the operation was to set up, at the hernial opening, a chronic inflammatory process, with the hope that the opening would be converted into or plugged by a thick mass of cicatricial tissue. These attempts rested on the false idea that the thicker the cicatrix the better the closure. But cicatricial tissue atrophies easily and presents very little resistance. Directly opposed to the old methods are the new ones which aim to cause as little cicatricial tissue as possible, and to close the canal in all its parts in the simplest way possible, so that the natural condition of things will be restored. With this view in mind it has been proposed to tie off or sew up the neck of the sac as high as possible, to extirpate the sac, suture the pillars of the ring, and even slit up the inguinal canal. All the new operations simply differ from one another in that more or less stress is put on one of the above mentioned points.

The abdominal ring was first freshened up and successfully closed by suture by Gross, in 1858; after that it was abandoned, and the idea was again taken up by Steele in 1874, he using catgut instead of silver wire. Dowell and Wood sutured the ring subcutaneously by means of silver wire. Czerny opposed this subcutaneous suture on the ground of its uncertainty, and proposed, together with the ligature of the neck of the sac and removal of the rest, the closure of the hernial opening by means of the pure string suture, and laid much stress on the material employed, stating that the closure was more permanent when silk was used instead of catgut.

In 1884 silver wire was again brought into use, and was employed by Banks; the wire used by this surgeon was of such thickness that it could be easily knotted together, instead of twisted, and since 1887, Schede has employed wire for suture of the ring, allowing this wire to remain in place, being of the opinion that while it remains in place it keeps the pillars approximated and gives a firmer support to the cicatrix.

Lucas Championnière stated that suture of the ring played no part in giving a permanent result, for healing of the aponeurotic columns could not be obtained, and that in many cases of permanent cure the sutured ring was still of sufficient size to admit the tip of the finger; hence healing together of the pillars could not have taken place, and he ascribes the good result to other causes, such as the extirpation of the sac, and its ligature high up. But according to most other surgeons, where permanent cure has taken place there has been more or less growing together of the aponeurotic columns, and all that is needed is a narrowing of the ring, not its complete closure, and this narrowing is obtained by the suture.

Great weight has been placed on ligating the sac as high as possible, but there is a slight difference of opinion as to whether it should be extirpated, or left alone, after being ligated. Schede is of the opinion of leaving it alone, while Langenbeck always advised its complete extirpation. Brocier, who has paid considerable attention to the treatment of the sac, is of the following opinion:

Its extirpation can, under favorable circumstances, bring about a more rapid closure of the wound, but extirpation is not to be done in very weak patients on account of the dangers of prolonging the operation. Extirpation is indicated when the sac is but slightly adherent, and especially where it is thickened and degenerated; contra-indicated when it is strongly adherent, and where very large herniæ exist. If the sac be very thin, and but slightly altered, or if it be firmly adherent, it does not interfere with the healing *per primam*. In cases where the sac is strongly adherent, but of doubtful viability, its disintegration by suppuration is to be preferred to the dangers attending its extirpation. In Schede's clinic, extirpation of the sac is the rule, and Schede uses numerous interrupted sutures of No. 1 catgut, going under the bottom of the wound, so that all the parts are brought into perfect apposition, through a continuous superficial suture of the same material. At the same time he does away with irrigation, and only uses sponges soaked in a bichloride solution.

Küster, of Berlin, closes his wound by *etage* sutures. Riesel has advised slitting up the inguinal canal, removing the sac at its junction

with the peritoneum, and then removing so much from the sides of the inguinal canal that by sutures it can be tightly closed around the spermatic cord. Leissink endorses this method, and states that unless this is done the operation is incomplete. Schede condemns this procedure as not only useless but dangerous, and contents himself, like most surgeons, with ligating the sac as high as possible.

Special attention has been given to the point if a light truss should be worn after the radical operation. Anderegg, in 1886, as a result of his experience at Socin's clinic, was of the opinion that so long as no recurrence took place the wearing of a truss should not be allowed, for by pressure of the cushion a depression was produced, which, after the removal of the truss, was converted into an elevation, and the peritoneum became loosened around its margins, predisposing to a return of the trouble. Socin, Beck, Banks and Riesel report a number of cases of permanent cure where patients left off wearing a truss immediately after the operation, and have remained perfectly well, notwithstanding heavy work. On the other hand, many competent surgeons, Schede in 1877, Tilanus 1879, Maas 1879, Lucas Championnière 1885, König 1885, are all of the opinion that a light truss should be worn for some time after the operation. At Schede's clinic it is the rule to advise the patients to wear a light truss for the first few months following the operation, and then to gradually abandon it.

Of the 58 patients examined by Wolter a long time after the operation, among the 43 cured, 27 had regularly worn a truss, 6 only when doing heavy work, 2 had abandoned it immediately on leaving the hospital, and 9 at some time varying from 5 weeks to 2 years after the operation.

Of the 15 recurrences, 6 wore a truss continuously since the operation, 1 wore it irregularly, 3 abandoned it immediately after leaving the clinic, and in 5 no definite data could be obtained.

Dr. Wolter is of the opinion that the permanent cure is in no way affected by the wearing of a truss, and at no time was he able to find any pressure atrophy or any loosening of the peritoneum, and he deems it advisable that the patients should wear a light truss for some months after the operation. Since 1877 Schede has changed his views

on the subject, and claims that pressure of the cushion does in some cases cause atrophy of the scar and now deprecates the use of a truss immediately after the operation, but says all cases must not be judged alike. Where silver wire has been used and left in place he advises no truss; also where the wound has healed throughout per primam, also where the contents of the hernia was only omentum, which was removed.

The tendency to recurrence is much greater when the contents are coils of intestine.

According to Anderegg and the writer, return is more frequent in inguinal than in femoral hernia. In the 22 cases of femoral hernia examined, there were 4 returns, or 18.2%. In the 36 cases of inguinal hernia examined, there were 11 returns, or 30.6%.

The operation of radical cure can be undertaken at any age with the prospects of good results, but the prognosis for permanent cure seems to be specially good when the operation is done in childhood.

The subsequent occupation of the patient as regards heavy bodily exertion seems to have no influence on the return of the trouble. Nussbaum and Anderegg advise a series of gymnastic exercises, after the operation, destined to strengthen the abdominal muscles. Certain constitutional conditions, such as a strumous diathesis, flabby condition of the muscles, and emaciation, greatly interferes with the prospects of good results.

Indications for the Radical Operation.—In all cases of strangulated hernia, where the condition of the intestine permits of its return to the abdominal cavity, the radical operation should be attempted.

The radical operation should not be attempted in early life when, by proper treatment by means of a truss, a cure can be expected. In childhood when, after a prolonged treatment by a truss no result is obtained, a radical operation is to be advised, for this is the time when the best and most permanent results are obtained. According to Rothmund, only up to the 7th year is a cure to be expected by the bloodless method, and from that time on the chances for success diminish.

Reducible herniæ, occurring in youth and adult life, but which are

easily held in place by a truss, and cause no discomfort, ought to be treated conservatively, unless such patients desire a quick and permanent cure.

Irreducible herniæ, as well as those which can not be held in place by a truss, and in fact all those which cause serious discomfort to the patient, present sufficient indications to warrant an attempt at radical cure.

Contra-indications to the radical operation are those cases of strangulated herniæ in the aged, where, in consequence of strangulation, a prolonged operation would be dangerous, and the surgeon must be content with relieving the constriction. Very large strangulated herniæ in the aged should not be operated on radically, and the constriction only should be cut. The radical operation is contra-indicated in all cachectic conditions, and in old age, where it is to be supposed that the patient will be confined to bed for a long time.

F. C. HUSSON.

INDEX OF SURGICAL PROGRESS.

GENERAL SURGERY.

I. Sterilizer for Surgical Purposes. By DR. STRAUB (Utrecht, Holland). The author had used, in the pathological laboratory of the military hospital in Utrecht, for a long period of time, a very simple apparatus, viz., a pea-steamer which was used in the kitchen, for the purpose of disinfecting the cylinders in which the cotton is kept, nutritive soil for bacteriological experiments, etc. The water tank of the steamer was used for the disinfection of instruments. When he, later on, was ordered by the inspector of the sanitary service to report on the introduction of a sterilizer for use in the military hospitals and in the field, he thought of having the pea-steamer made on a larger scale and of stronger material. Especially one disadvantage had to be improved in the construction of these large apparatuses. The objects and instruments which were disinfected in the above mentioned apparatus were somewhat moist; being a result of the condensation of the small quantity of the steam which penetrated into it. This disadvantage had to be done away with. The apparatus consists of a cylinder shaped water-tank, which furnishes the steam and simultaneously sterilizes the instruments, and a cylinder covered with felt for the sterilization of dressing material, pus basins, towels, operating coats, etc. The *modus operandi* of this very excellent and inexpensive apparatus is extensively described in the original article.

The reliability of this sterilizer has been proven by numerous bacteriological experiments made with it by Straub in the pathological laboratory.

The apparatus is also much cheaper than other similar ones constructed for the same purpose, and if dressing material saturated with

antiseptics are rendered superfluous, then a considerable saving will result if this apparatus be used any length of time.

A half an hour is required for sterilization. The sterilization of instruments is to be practiced with care. The quality of the water may influence it and not all instruments bear the boiling process equally well. If the boiling of instruments is to become universal, then instruments with metallic handles will be generally used.

The sterilizer is to be had at the instrument maker Harting-Bank in Utrecht, Holland, for 36 gulden (\$10).—*Nederlidschr. voor Geneeskunde*, 25, 1889.

F. H. PRITCHARD (Boston).

OPERATIVE SURGERY.

I. New Method for Preventing Hæmorrhage During Amputations at the Hip-Joint. By DR. J. A. WYETH (New York). The limb having been elevated and an Esmarch bandage having been applied, two steel mattress needles, three sixteenths of an inch in diameter and a foot long, are used. The point of one is inserted an inch and a half below the anterior superior spine of the ilium and slightly to the inner side of this prominence, and is made to traverse the muscles and deep fascia, passing about half way between the great trochanter and the iliac spine, external to the neck of the femur and through the substance of the tensor vaginæ femoris, coming out just back of the trochanter. About four inches of the needle should be concealed by the tissues.

The point of the second needle is entered an inch below the level of the crotch internally to the saphenous opening, and, passing through the adductors, comes out about an inch and a half in front of the *tuberischii*. No vessels are endangered by these needles. The points are protected by corks to prevent injury to the operator's hands.

A piece of strong white rubber tube half an inch in diameter, and long enough when tightened in position to go five or six times around the thigh, is now wound very tight around and above the fixation needles and tied

The Esmarch bandage is removed and five inches below the tourniquet a circular incision is made, and a cuff which includes the subcutaneous tissues down to the deep fascia is dissected off to the level of the lesser trochanter, at which level the muscles and vessels are divided squarely and the bone sawed through. All vessels (including the veins) which can be seen are tied with catgut and the smaller bleeding points can be discovered by slightly loosening the tourniquet.

The remaining portion of the femur is now easily removed by dividing the attached muscles close to the bone and opening the capsule as soon as it is reached. On lifting the end of the bone in the direction of the patient's navel and dividing the cotyloid ligament posteriorly, the air enters the cavity of the acetabulum and greatly facilitates the division of the ligamentum teres.

GYNÆCOLOGICAL.

I. Three Cases of Prolapsus Urethræ Feminalis. By A. SO-
DERMARK (Boras, Sweden). The writer wonders at seeing this disease spoken of as of rare occurrence. He has seen 3 cases in 3 years. The symptoms produced by this are not unimportant. As to the treatment he prefers removal with the knife or scissors with subsequent suturing of the parts by the ligature or touching with the galvano-cautery.

1. A woman, æt. 58 years, with prolapsus uteri, cystocele and rectocele as complications. At the meatus urinarius there was a tumor the size of a walnut and partially gangrenous, in the middle of which an opening led into the urethra. Extirpation was done by means of the galvano-caustic loop. Later colporrhaphia duplex was performed. Discharged as cured.

2. A woman, æt. 70 years, had noticed at the external urethral opening a tumor the size of a plum, formed by the mucous membrane of the urethra. Removal by means of the galvano-cautery. Recovery.

3. A girl, æt. 9 years. At the external urethral opening there was a tumor formed by prolapse of the urethral mucous membrane. This tumor about the size of an almond. Removal by means of the scis-

sors; sutures were inserted. Recovery. — *Hygeia*, 1889, Bd. LI., No. 5, pp. 306-307.

II. Complete Prolapse of the Uterus in a New-Born Child. By N. GUISLING. The writer describes a child, born with spina bifida and bilateral clubfoot, which soon after birth was taken with diarrhoea and with incessant straining. A complete prolapse of the uterus, projecting 3 cm. from the vulva, developed, the child perishing in a few days. A post mortem examination was made which revealed nothing abnormal in the pelvis except a laxness of the ligamenta lata and rotunda. The prolapse was probably caused by the abdominal pressure. — *Norsk Magazin for Tægevideuskaben*, 1889, 4.

III. Carcinoma Uteri Prolapsi. By E. ULLMANN (Vienna). Cases of cancerous degeneration of prolapsed uteri are of extreme rarity; only three have been already described in the literature. The writer describes a fourth case — that of a woman, æt. 81 years — in his communication. The total prolapse had existed nearly 20 years; during the latter months an epithelioma developed in the middle of the prolapsed uterus, which gave much annoyance by hæmorrhage and pains. Total extirpation of the uterus was done, which was followed by recovery. — *Wiener Medicin Presse*, 1889, Bd. xxx, No. 50

IV. On Total Extirpation of the Uterus through the Perineum. By FROMMEL. Basing his operation upon the attempts of Zuckerkandl to expose the pelvic organs through the perineum, by experiments upon the cadaver, the writer extirpated the uterus in a case of an extensive tumor of the cervix, extending also over onto the vaginal fornix. He made an incision uniting the two tubera ischii and then proceeding carefully upwards between the vagina and rectum until the space of Douglas is reached, from where he removed the uterus, then easily in view. This method is to be preferred in many cases of new growths, to the methods of operation in use up to now. — *Mnchuer Medicin Wochenschr.* 1889, No. 31.

V. Total Vaginal Extirpation of the Uterus for Retention of a Putrifying Placenta. By L. ROOSENBURG. The patient

in question was a woman, æt. 24 years, who had given birth to 2 fully developed children and then aborted at the sixth month. The midwife attempted to remove the placenta, but it presented some difficulties. In spite of the hæmorrhages which later on made their appearance, the uterus was curetted. March 24, abortion again occurred, at the fourth month. On the midwife attempting to remove the placenta the umbilical cord was torn off and the placenta remained in the uterus. Immediately after the labor the patient was seized with a chill which was followed by a feverish state. As these attacks repeated themselves daily and became more and more violent, the lochia but slightly bloody became putrid and the patient perceptibly emaciated. Roosenburg was called in March 30.

He found the patient in bed with a somewhat hippocratic face. Pulse very small (120), the abdomen more or less distended, the uterus to be felt below the umbilicus through the abdominal wall; the genitals covered with a black and putrid blood. The next day the patient was received into the hospital. Temperature 41.5° . Pulse 10. Respiration 40. The patient suffered from dyspnœa.

After disinfection of the vagina and uterine cavity, Roosenburg tried to gain entrance into the uterus. The mouth of the uterus surrounded by a thick and but little elastic wall, only allowed two fingers to be introduced with difficulty. Nothing of the placenta however could be felt. Fearing a rupture of the cervix from further attempts, nothing further was done in this direction. Energetic disinfection and a tamponade of iodoform gauze.

During the night the temperature fell to 37°C ; (the pulse remaining 124) to rise in the morning to 40°C . Pulse 132. Respiration 44. The next morning the tampon was removed. The mouth of the uterus not having dilated, an attempt was made to remove the placenta by means of Volkmann's curette (large size).

Disinfection again and tamponade. With rigors the temperature ran up to 40.5 . Pulse 145. The next morning the abdomen was greatly distended; nausea. As the writer got the idea that the patient could not live 24 hours longer total extirpation of the uterus through the vagina was performed with the patient's consent. After removal of

the uterus iodoform gauze was introduced into the lower part of the abdominal cavity and a large tampon of cotton dipped into iodoformized glycerine was placed into the vagina. The operation lasted an hour. Hot cognac was administered. The temperature remained 41.9° 2 hours after the operation, but in the evening it fell to 37.5° . Pulse 112. The pulse soon fell to 92 while the temperature remained normal; the ligatures came out after 10 days and after 14 days the patient could walk around the room. Immediately after the operation the uterus was examined. At the first incision over the posterior surface of the uterus through the peritoneum and half through the thickness of the uterine wall a very intense stench was remarked, while a second incision carried the knife into the uterine cavity through the placenta's middle. The placenta, very strongly adherent to the uterine wall, was upon its free surface black and stunk horribly. In some places a placentitis was to be observed.

In the literature only one such case is known, where SCHULTZE performed supravaginal extirpation. The writer in such cases would always perform the operation through the vagina. Besides that R is of the opinion that in cases of puerperal septicæmia where the first disinfection of the uterus is without result, where the diagnosis becomes certain through an incipient peritonitis and the relation between pulse and temperature permits one to give a gloomy prognosis, total extirpation should be performed as a last resort.—*Nederl. Gijdschr. v. Geneeskunde*, 1889, No. 21.

VI. Total Vaginal Extirpation of Uterus, Together with Portions of Pelvic Connective Tissue. By DR. PAWLİK (Prague). Proceeding from the fact that the recurrences after operation upon carcinomatous uteri appear most frequently in the connective tissue of the parametria and extension of the carcinoma into this tissue too often renders the operations futile, Pawlik determined to remove the parametria with the uterus. He sounded the ureters in order to avoid injuring them. This procedure he has tried upon three patients.

I. The first case was that of a midwife, æt 48 years, with an ulcer-

ating carcinoma of the portio which on the left side had extended over on to the vaginal wall for one centimeter. There was painful infiltration of the left parametrium which, however, did not extend up to the pelvic wall. The left ureter could be separated. An operation was performed October 18, 1888, with a sound in the left ureter and a rubber tube to carry the urine off into a receptacle.

The uterus and the left parametrium, close up to the lateral pelvic wall, as well as the left cystic ovary, were extirpated. Recovery uneventful. No recurrence up to one half year later.

II. A cauliflower growth of the portio; the vaginal insertion of the uterus free from any infiltration. From the right border of the cervix, a band, the size of one's little finger, ran up to the sacro-iliac articulation. The uterus and this band were extirpated without any sound in the ureter, as the ureter was thought to be out of danger. Recovery took place. The 28th day after the operation, after removal of the last ligature, the urine dribbled out of the right ureter, which had undoubtedly been caught in a ligature. The uretero-vaginal fistula closed closed spontaneously.

III. A large infiltrated ulcerated carcinoma of the portio, and in the left parametrium, a band the size of a finger, and running to the lateral pelvic wall. On the right side a similar but much smaller band was felt. An operation, May 24, 1889, was performed. Both ureters were sounded. The uterus and the band of the left side were removed, the band as near to the pelvic wall as possible. After removal of this band the other disappeared; it was clearly only an expression of the tension of the left. The course of the recovery was uneventful.—*Casopis Ceskych Lekarů*, 1889, No. 28.

F. H. PRITCHARD (Boston).

VII. A Contribution to the Treatment of Large Uterine Myomata Undergoing Expulsion. By PROFES-OR FEHLING (Basle). The frequently unfavorable termination following operating upon submucous myomata from the vagina (14-25% mortality) and the bad results after such procedures led Fehling to remove the tumor in three such cases where the tumors were in the process of

expulsion, not by the vagina but by laparotomy. These interesting cases are here given in an abstracted form.

The first case was that of a woman, *æt.* 49 years, who had remarked in the course of the last few years the development of an abdominal tumor, which finally increased rapidly in size. Reduced greatly by hæmorrhages, and finally by fever, the patient sought medical aid. A tumor was found extending nearly up to the thoracic wall, which at the same time filled out the pelvis and had also extended down to the entrance of the vagina. No portio could be found, the os uteri only to be felt anteriorly behind the symphysis as a narrow seam of mucous membrane. Fever was also present in consequence of septic endometritis.

Laparotomy was performed. After opening the abdomen and separating the omental adhesions, the tumor was brought forward, the ovaries ligated, the bladder separated and the uterus constricted by the elastic ligature. Then an incision was made into the anterior wall of the uterus and the soft myoma situated under the mucous membrane separated from the surrounding tissues and completely enucleated. The lower piece reaching down into the pelvis passed well through the elastic ligature, then another ligature was applied, the uterus amputated, the stump being cared for according to Hegar. The pedicle was treated extra-peritoneally. Recovery.

In the second case the tumor in question was a sub-mucous myoma, the process of expulsion was of long duration, the deepest portion projected from the vagina and showed incipient necrosis. This patient also was so reduced by continuous hæmorrhage and septic endometritis that the danger forced an operation. This resembled entirely that of the first case and the condition revealed itself to be two separate myomata which were both enucleated and removed. One of these was suppurating, its removal being effected through the vagina. The stump treated as above. Recovery.

The tumor in the second case had also developed rapidly, leading to much hæmorrhage and also was partly protruding into the vagina. Phenomena of pressure and septic peritonitis indicated a speedy removal. The operation was performed as in the first cases; here also

the bladder had to be separated manually before applying the elastic ligature, and the entire tumor, together with that portion in the vagina, was removed through the uterine wound. Besides the tumor there was found here a circumscript pyosalpinx of the right Fallopian tube.

During the days immediately following the operation the temperature still remained high; the further course of the case was a favorable one.—*Cor. Bl. f. Schweizer Aertze*, xix, 21, 1889.

REVIEWS OF BOOKS.

HANDBUCH DER CHIRURGISCHEN TECHNIK, BEI OPERATIONEN UND VERBANDEN. VON DR. ALBERT R. VON MOSETIG-MOORHOF. Erster Band. Allgemeine Chirurgie: Dritte verbesserte und vermehrte Auflage. Leipzig und Wien; Franz Deutick; 1890. New York, G. E. Stechert.

MANUAL OF SURGICAL TECHNIQUE IN REGARD TO OPERATIONS AND DRESSINGS.

The third edition of this practical surgery appears in two volumes, the first of which, dealing with elementary operative procedures, and operations upon the various anatomical tissues, systematically considered, has just come to us from the press. The object of the book is to offer practical advice to the practicing physician, and be a teacher and guide to the student, whose theoretical knowledge as regards operative measures, is greater than his technical ability.

The first volume contains a chapter on anæsthesia and narcosis; then follows an exposition of the methods of treating wounds.

Preparation for operations, hæmostasis, sutures, division of tissues, removal of substances, artificial destruction of tissue and general elementary operative procedures are next considered. Then operations on the skin, the muscles and their tendons, the blood vessels, the nerves, the bones and joints are discussed; and, finally, all kinds of dressings and their application are treated of in detail.

In a word, the book, as far as the first volume is concerned, represents a complete minor surgery considered from an objective point of view. For the illustrious author has everywhere kept his personal views in the background.

The book is well gotten up, in large octavo form, and contains some 430 pages and many handsome wood-cuts, representing mostly instruments and bandages.

The descriptions of the various methods of operating and applying dressings are quite concise, embodying the generally accepted views

of the best surgical systems, and giving the European literature of the subjects. Two indices, one of authors, the other of subjects, make reference to the pages of the book easy.

DIE KRANKHEITEN DER HARNBLASE. Von Prof. Dr. R. ULTMANN. Deutsche Chirurgie. Lief. 52. Stuttgart, Ferd. Enke. 1890. New York. G. E. Stechert.

THE DISEASES OF THE URINARY BLADDER.

This volume, uniform with the others of Billroth and Luecke's series of "German Surgery," and illustrated by 182 wood-cuts, is completed and edited by Dr. Moritz Schustler, of Vienna, and forms a most valuable work of reference on the subject of vesical diseases.

After a short sketch of the anatomy and physiology of the bladder, and a more lengthy consideration of the condition of the urine in diseases of the bladder, the author details the methods of examining the organ, and then discusses the malformations, wounds and injuries and urinary fistulæ, herniæ, the disorders of nutrition, including cystitis, calculi and foreign bodies, parasites and neoplasms of the bladder, and concluding with the neuroses.

The literature of the subjects is everywhere alluded to, special attention being given to the history of each, and the book presents a comparatively concise and clear expose of the best current views on the lesions treated of.

LEHRBUCH DER CHIRURGIE UND OPERATIONSLEHRE. Vorlesungen von Dr. EDWARD ALBERT. Vierte, umgearbeitete Auflage. Wien und Leipzig, Urban und Schwarzenberg, 1890. New York. G. E. Stechert.

TEXT-BOOK ON SURGERY AND OPERATIVE TECHNIQUE.

The first volume of the fourth edition of this popular book is now before us, treating of the surgical diseases of the head and neck, and appearing in a much improved form. A large number of new illustrations accompany the text, and the older ones are newly cut.

The chapters on anæsthesia, hæmostatics and the treatment of wounds are omitted, as not belonging to special surgery, which the work treats of.

Glancing through the book, we notice that all the more recent ad-

vances of late years have been incorporated in the text, without, however, interfering with a certain conservatism of the author's, very properly compatible with the eminence he enjoys as a teacher. These advances are specially noticeable in such chapters as that on brain surgery and thyroidectomy.

There has been much material added in the way of short histories of recent cases observed by the author, and illustrations of specimens from the Vienna pathological museum, contributed by Prof. Kundrat, which adds so much to the perspicuity and attractiveness of the author's style in treating the various subjects, that it is indeed difficult to lay the book down after one has commenced a chapter.

The book is handsomely gotten up by the publishers.

THE OPERATIVE TREATMENT OF GOITRE.

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WITHIN the last four or five years there have been so many diverse methods introduced for the removal of thyroid tumors that a collective review of the very extensive literature of the subject appears of some interest to the practical surgeon. Regarding the operative technique alone, there are at the present time at least ten different procedures in use for the treatment of goitre; yet, while all are recognized as legitimate operations, some bear identical, or very similar titles, and others are known only by the names of their authors. It is proposed here to enumerate and describe these various methods with a view to facilitate comparisons between them, as well as to attain some unity in the use of the terms employed in connection with these operations. Before turning to the operative technique proper, it is, however, advisable to glance cursorily at our present knowledge of the anatomy, both normal and morbid, of the thyroid gland; for it is largely due to comparatively recent advances in this direction that an operative interference with the thyroid growths has become modified.

The normal thyroid gland, with its two lobes joined together by a bridge-like portion, the isthmus, consists of a stroma of connective tissue forming septa between which the lobules of the gland are situated. These lobules are again composed of smaller divisions, which may be termed granules; and these are in like manner separated by trabeculæ of connective tissue. These granules are composed, in the fully developed gland at birth, of a number of follicles, regular in size and shape, each con-

sisting of a layer of nucleated cells in the periphery (epithelium), and a drop of gelatinous fluid in the centre. They are surrounded by soft connective tissue, bearing capillaries, which is termed the interstitial tissue.

We therefore have to discern between three kinds of septa, (1) the smallest, being the last-named interstitial connective tissue between the follicles; (2) the intermediate septa or trabeculæ between the granula, or conglomerations of follicles, likewise bearing blood-vessels; and (3) the largest septa, separating the lobules of the gland and enclosing the largest vessels. These latter septa are in connection with the capsule of the gland.

In the fœtal period, however, before birth there are no follicles present; but the granula contain larger masses of cells grouped together, either in round heaps or in elongated cords, and each is covered by a proper membrane. The follicles are formed at a later period by the cells arranging themselves into globular masses, in the middle of which a small quantity of gelatinous fluid is seen, which soon undergoes colloid degeneration.

Turning now to the minute anatomy of goitre, we find the main variation from the structure of the normal thyroid in the irregularity in the arrangements of the parts. At the beginning of the disease we not only find irregularities as to the arrangement of tissues, for there are well-developed follicles in close proximity to the larger solid masses of cells, globular or elongated, but also marked irregularities in the size of these formations. The clusters of cells, as well as the follicles proper, vary extensively in the size and in the number of cells contained in each, and the cells themselves vary, resembling at some points flat, and at others cylindrical, epithelial cells.

In the further development of goitre this irregularity is even more marked. The round groups and the solid cords mentioned above commence to grow by the division and subdivision of the cells contained in them: but not equally in all parts. In this manner the shape of the groups is altered; the cords become bifurcated or ramified. The next step is the formation of solid follicles within the groups, in the centre of which a small amount of gelatinous fluid appears; or else a

drop of the gelatinous fluid may appear in the midst of the solid clusters and the cells subsequently group themselves around them. In like manner the solid cords are formed into tubules. These tubules frequently open into each other in consequence of their irregular growth, and the follicles, too, often intercommunicate, by means of openings in the epithelial layers. These communications may become so marked that they form a reticular structure, in the meshes of which the interstitial tissue with the capillaries appears imbedded—and this is especially noticeable when cylindrical epithelium is present.

The irregularity in the development of these formations, the formation of new cells by division at certain points, is reflected in the macroscopical appearance of goitre. We there encounter nodes situated in various portions of the tumor, more or less removed from the centre, and consisting of tissue which may be either softer or harder than that surrounding them. Almost always they are covered with a layer of connective tissue: a capsule more or less pronounced; and they appear of varying size and shape.

It is easy to understand how irregularities in the developmental growth of the tissue may lead to the formation of these nodes; we need only imagine that varying numbers of cell formations take part in the production of the nodes, and that the commencement of their growth is not simultaneous.

These forms of goitre exhibiting nodes may be classed together under the heading "*struma nodosa*," for practical consideration. It is probable that all pathological changes in the thyroid gland commence, as above described, by a proliferation of the cells of the parenchyma. The elongated masses of cells push their way out into the connective tissue surrounding them, and then become converted into follicles and tubules. This form of *struma nodosa* is termed *struma hyperplastica follicularis*, and is remarkable for the softness of the nodes.

The connective tissue surrounding these follicles may, however, commence to proliferate; it inserts itself between the follicles, surrounds the tubules, and by contracting chokes off parts from them; subsequently much of the parenchyma may be thus destroyed, and the connective tissue is found in its

place This is *struma hyperplastica fibrosa*. In this form the nodes are extremely hard.

Again, the capillaries may play an important part in the proliferation, and we have then *vascular hyperplasia*, which may be subdivided into the aneurismatic and the varicose forms, according to whether the arterial or the venous vessels predominate. There is also an amyloid form, the capillaries having undergone amyloid degeneration.

These forms may present certain combinations. The parenchyma may remain comparatively unchanged in the periphery of the nodes, presenting solid cell clusters and cords and follicles, while the connective tissue and capillaries undergo hyaline degeneration in the centre. Or, again, the periphery may show the same forms as before, but fibrous or calcified masses may appear in the centre.

A frequent occurrence is the conversion of nodes into cysts. This may take place by hyaline degeneration of the connective or fibrous tissue (degeneration cysts); or else by hyperplasia and enlargement of the follicles, so that they encroach upon and rupture into one another (dilatation cysts).¹

It is probable that these cysts increase in size, in consequence of small hæmorrhages which take place into the cyst when the surrounding tissue undergoes colloid degeneration. Every tissue-formation in goitre may undergo this colloid metamorphosis, including the vessels and their contents; but, unfortunately, our knowledge of the chemistry of colloid masses is very limited, and this is one of the principal reasons why our understanding of thyroid pathology is still so limited.

We have hitherto turned our attention solely to the *struma nodosa*, where proliferation takes place only at certain points, and in an irregular manner.

¹Gut Knecht classifies *struma nodosa* in the following manner:

- I. Nodes consisting of hyperplastic parenchyma (*struma colloides*).
- II. Nodes with hyaline degeneration in the centre and solid cell-masses or colloid follicles in the periphery (medullary form).
- III. Nodes with preponderance of fibrous connective tissue in the centre, or calcification, the periphery being as before. (Nucleated form.)
- IV. Nodes with vascular hyperplasia.
- V. Nodes representing cysts.

If the proliferation of the parenchyma takes place equally throughout the whole gland, we speak of hypertrophy. If only the number of cells are increased, we term it *struma hypertrophica parenchymatosa*; if, however, the size of the follicles and tubules are increased in consequence of a dilatation by their contents, we have *struma hypertrophica gelatinosa* or *struma colloides*. The cells are not equal in size.

We must now briefly refer to the term, adenoma, which is frequently used in speaking of the enlargements of the thyroid body. *A priori*, there is no reason why both the hypertrophic forms, and, especially, the hyperplastic forms, should not be termed adenoma, for the analogy to such growths in other organs is present.

But Wœlfler, who has given special attention to the histology of struma, and is the most copious writer on the subject, uses the term adenoma with a special signification, and it is best, in the opinion of the present writer, to use the term adenoma only in connection with Wœlfler's name; or, at least, to use it only in the same sense with this author, in order to avoid confusion in the nomenclature.

Wœlfler believes that when the cell-clusters and cords, referred to above, have once developed into perfect follicles and tubules, there can be no further development nor hyperplasia. He believes, however, that there may be lodged in the interstitial tissue, between the follicles and tubules, certain embryonic cells, misplaced here, as it were, in the formative period of development, which may at any time proliferate and develop into well-formed follicles and tubules, no different in appearance from the older ones. Wœlfler's adenoma is therefore understood to mean a new growth of parenchyma-cells within the interstitial tissue, forming new follicles between the older follicles, while these latter increase in size only; for this form we adopt the term *adenoma interacinosum*. But, as Wœlfler's nomenclature is not generally accepted by all writers, and would add nothing to the perspicuity or intelligibility of this review, we may better disregard it for the present. Suffice it to say, that the various forms of Wœlfler's adenoma (of which there are at the least six) belong under the heading *struma nodosa*. These nodes, according to Wœlfler, are easily

enucleated, excepting in the case of what he terms malignant adenoma, in which forms the nodes cannot be detached from the surrounding parenchyma.

Turning now to the more malignant growths of the thyroid, we find, although rarely, unmistakable specimens of primary carcinoma and sarcoma of the gland. But apart from these, there is a form of malignant, cancerous tumor of the thyroid body, which on account of its close relation to goitrous tumors and in contradistinction to the true carcinoma just referred to, is termed malignant goitre, or struma maligna.

On examining this class of tumors, we find the greater part of the structures resembling one of the other forms of goitre; but at certain points, one or more, the cells suddenly appear grouped in clusters, supported by a stroma of connective tissue, representing an unmistakably carcinomatous picture.

The chief point of interest in these malignant forms of goitre is their ability to cause metastasis; and in the metastases so formed we may again have tumors resembling simple goitrous tissue, with little analogy to malignant growths, except at certain points. These metastases may occur below the sternum, under the maxilla, or in the lungs. In any case, however, whether the thyroid tissue of these tumors appears malignant or not, the clinical course is always malignant. They probably turn into cancers.

We now turn to the subject of the vascularization of goitre. This theme has been the subject of special study by Anna Begoune.

The four arteries supplying the goitres are the two superior, and the two inferior thyroid arteries. The superior thyroid from the external carotid, divides into two branches before entering the capsule of the upper portion of the thyroid body, and afterwards sends its smaller branches into the gland along the septa. In some cases there are three branches, when it is greatly developed.

The inferior thyroid artery enters the gland from below posteriorly, also divided into two branches, between which the recurrent nerve is said to lie in some cases. These branches also nourish the isthmus. These two systems do not anastomose so that the vessels of the inferior thyroid cannot be in-

jected by injection of the superior, and *vice versa*. On the other hand, however, a great part of the trachea, the larynx and epiglottis, and portions of the œsophagus can be injected through the thyroid arteries.

Occasionally (once in ten cases) there exists also a thyroidea ima artery, which should be borne in mind, when ligation of the arteries is practiced.

The veins met with during operation are generally abnormally enlarged, and appear formidable on this account. They require double ligation. The subcutaneous veins of the neck, the external jugular, the oblique jugular, the anterior jugular may be met with in dealing with the superficial tissues. Beside the veins accompanying the large arteries supplying the gland proper, we frequently find accessory veins, which require attention. There are the *venæ thyroideæ superiores accessoriae*, the *vena communicans superior* (between both superior thyroid veins), the *venæ thyroideæ inferiores accessoriae*, and the *venæ thyroideæ imæ*, of which there may be two, connecting the left lobe with the *vena anonyma*.

The veins accompanying the arteries course in the capsule of the gland for a greater extent than do the arteries.

In the goitrous tumors which we have termed hypertrophic, the vascularization is analogous to the normal gland in infants; the capillaries lie in the interstitial connective tissue between each follicle. The nodes in *struma nodosa* are, however, ill supplied with vessels; in cystic formations, too, the vessels are for the most part destroyed.

Where we encounter thickened capsules, as in larger cysts, the blood vessels follow a general rule; the larger vessels supplying the capsule advance toward it at right angles to it; but in the capsule itself they all run parallel to its superficies.

As to the nerves which require consideration, there are four. The sympathetic, the pneumo-gastric, the hypoglossus have all been injured during operations upon *struma*, and have been made accountable by some for a sort of cachexy consequent upon removal of the gland, known as *myxœdema* or *cachexia thyropriva*.

One pneumo-gastric nerve may be cut without occasioning any untoward symptoms. Lesions of the sympathetic pro-

duce exophthalmus, dilation of the pupils, a frequent pulse, and vasomotor disturbances. Severing of the hypoglossus causes unilateral paralysis of the tongue.

The recurrent laryngeal nerve has received the most attention, on account of its close proximity to the inferior thyroid artery, and because of its frequent injury during operations for goitre, the immediate consequence of which is unilateral paralysis of the vocal chords.

The exact anatomical relation of this nerve to the inferior thyroid artery varies in the cases. In one-third of the cases the nerve lies in front of the transverse portion of the inferior thyroid artery; in another third it lies behind, and in the rest of the cases it lies between the branches of the artery, before they enter the gland. On this account ligation of the inferior thyroid artery should be done at a point as far as possible removed from the gland, near its origin; or else the branches should be separately tied at the points where they enter the capsule of the gland. At the point where the inferior thyroid artery alters its course from the vertical to the horizontal direction no injury to the recurrent nerve is to be feared, but here injury may be done to the cardiac branches of the sympathetic.

The points where the recurrent is the most exposed to injuries are: firstly, in the angle between the superior margin of the isthmus and the upper cornu, where it advances toward the muscles of the larynx; and, secondly, further below, in the groove between the œsophagus and the trachea.

Finally, a word must be said in regard to the capsule of the gland. The gland is frequently spoken of as covered over with two layers of tissue: the fascial fibrous sheath, which is generally termed the capsule of the gland, but which should not on any account be confounded with the proper capsules enveloping the nodes or the cysts of goitre; and, immediately beneath this, the tunica propria of the gland consisting of connective tissue. But these conditions are limited to struma nodosa, and limited also to those parts where the enlarged nodes lie adjacent to the capsule of the gland—this tunica propria being nothing else than the thin layer of parenchymatous tis-

sue enveloping the nodes, which has undergone transformation into connective tissue through pressure.

We have given these anatomical data at what may appear unnecessary length in order to render the following survey of operative methods more comprehensible and concise. We now turn to the consideration of the methods of operating for goitre. For the present, however, we do not consider the forms of goitre where the tumor is represented by one large cyst; nor do we, for the present, take into consideration the treatment of goitre by injections with iodine, arsenical or other solutions, but merely the operative interference with a view to the removal of the tumor.

There are at the present time at least eight recognized methods of thyroidectomy, either partial or total, without including the variations of each, and almost all the terms generally applied to surgical procedures have been used in connection with goitre, not excluding "resection" and "amputation."

It is of some advantage to be able to designate an operative method for the removal of goitre by a single term, and without necessarily mentioning the name of the author first introducing it; so that in the following pages we shall adopt the nomenclature generally accepted for specifying the operations.

We distinguish between (I) extirpation (Kocher), (II) enucleation (Socin), (III) resection (Mikulicz), (IV) amputation (Nussbaum), (V) evacuation (Hahn), (VI) evident (Kocher), (VII) temporary deligation (Bose), (VIII) ligation of the afferent arteries, and (IX) combinations of the above, such as Kocher's combined enucleation and resection.

I. We begin with the classical extirpation of goitre, as described by Kocher in 1883, and still used in the main by him.

(a) The incision through the skin and superficial fascia runs upward in the median line from the sternum to the cricoid cartilage; from here at an oblique angle (which should be, however, well rounded) to the upper part of the sterno mastoid muscle. This line of incision meets the anterior and oblique jugular vein at a more or less acute angle.

(b) The muscles overlying the thyroid body are now cut through at the same points where the skin was incised.

(c) The gland being now exposed, the superior thyroid artery is secured, as are also (d) the large veins: the superior thyroid, the communicating superior, and accessory superior thyroid veins, as well as the inferior, the inferior accessory, and the communicating inferior thyroid veins, and the ima. Kocher first called attention to the importance of ligating these veins.

(e) The next step is to split the capsule of the thyroid body—that is to say, the external one, but not on any account the inner proper capsule.

(f) The capsule is now to be stripped off the tumor until (g) the tumor can be turned out of the wound.

(h) The inferior thyroid artery is now to be ligated at a point close to the carotid artery (not near the tumor); after which (i) all vessels entering from behind are caught, and then it is only necessary to (j) isolate the isthmus and cut off the tumor.

In this way one lobe of the thyroid is extirpated, and in case removal of the other half should be indicated, the process may be repeated on the other side. In this manner Kocher has operated upon some 400 cases, doing at one time 89 and at another 71 consecutive cases without a mishap. In his last report on 250 cases he places the mortality percentage at 2.4% for all cases: Excluding malignant forms, however, and five cases of exophthalmic goitre (Grave's disease), the mortality percentage was only eight-tenths of one per cent.

As regards the method of this operation, the fear of injury to the recurrent laryngeal nerve has led its author to tie the inferior thyroid artery at a point as far removed from the body of the tumor as is consistent with the safe avoidance of the cardiac branches of the sympathetic; and by exercising due care not to injure the recurrent above the isthmus, where it approaches the larynx, the operation does not threaten the integrity of the nerve, since it need not be exposed where it lies in the groove between the trachea and œsophagus. As regards the technique during the operation, all irrigation is done away with as unnecessary, and silk is used throughout for

ligatures and sutures—catgut being discarded. After all arteries have been definitely tied, the wound is closed, and sublimated dressings applied.

This operation of Kocher's is termed the extra-capsular method of extirpation, because all the veins are tied, as is also the superior thyroid artery, before the capsule of the gland is incised.

The excision of goitre as described by Zesas, and done at Niehans' clinic at Bern, differs very little from Kocher's extirpation. The incision and the ligation of the superior thyroid artery are the same; the inferior thyroid is also ligated at a central point in the same way. Then the isthmus is ligated with an elastic ligature, and cut through, and lastly the tumor is separated from the trachea.

E. Rose, however, commences by cutting the isthmus, and then extirpates each half, tying each vessel as he encounters it. Rose, it must be remembered, performed tracheotomy immediately before the extirpation—a practice which has now been discarded in consequence of the many undesirable complications in the wound arising therefrom. In other cases, however, Rose left the isthmus uncut until he had freed the tumor, beginning in the region of the carotid, and applying ligatures continually as he proceeded. In some cases 200 ligatures were thus required, and much time and patience besides.

In contra-distinction to the extra-capsular method of Kocher, Billroth operates by the so-called intra-capsular method of extirpation. As soon as the thyroid body is exposed, the capsule is first slit up on a grooved director; the tumor is then enucleated as much as possible by blunt force, all veins and cords being doubly ligated and severed as they are encountered, running from the capsule to the gland. Frequent use is made of ligatures *en masse*. The inferior thyroid artery is to be tied after perfect isolation, with a view to avoiding the recurrent laryngeal nerve.

Kocher's first and original method was also an intracapsular one, but was abandoned prior to the year 1883.

Maas, whose method is accurately described by Rotter, operates from below upward, instead of, as does Kocher, from

above downward, and also uses an intra-capsular method. The incision is linear, parallel to the sterno-mastoid muscles, the flap containing the platysma. The muscles are now cut through transversely, the sterno-mastoid being again sutured, if cut, after the operation. The capsule of the gland is now incised upon the grooved director, and the gland turned out by blunt force. The inferior thyroid artery is now ligated at a point removed from the trachea; the superficial vessels supplying the inferior portion of the lobe are now tied, and the inferior portion made free. After this the upper portion is isolated and the superior thyroid artery and veins ligated. The gland now attaches only to the trachea, and may be pulled out towards the middle line, care being taken not to exert too much traction upon the trachea, and to avoid the recurrent laryngeal nerve. The isthmus is now tied *en masse* with silk, and cut off with the knife or galvano-cautery. In case total extirpation is indicated, this procedure is repeated on the other side. Maas uses a 2% solution of acetate of alumina for irrigation, chromated catgut for sutures, and a sublimated dressing prepared with sodium chloride—the whole being covered with protective. He operates, like Rose, with the patient in a half-sitting posture, and uses Thiersch-Nussbaum's combination of morphine and chloroform anæsthesia, ether being avoided as causing laryngeal irritation and coughing.

Baumgartner has proposed a modification of Kocher's manner of tying the inferior thyroid at a point removed as far as possible from the tumor. He argues that since a great part of the œsophagus, a large portion of the larynx and the trachea, are all supplied by the inferior thyroid artery (as Roux has shown by injection), it is not advisable to ligate after Kocher's manner. He, therefore, catches the inferior thyroids in hæmostatic forceps until the tumor has been removed, when he applies the permanent ligature; and can then be sure not to include the nerve in the ligature. But we should not forget that if once the recurrent nerve should be unintentionally caught in the forceps together with the artery, its function would be as surely destroyed as if it had been cut.

II. The operation termed enucleation was first introduced by Socin. Its performance depends upon the recognition of

the nodes, the formation of which is described above; as there stated, they are present in almost all cases of goitre. These nodes being surrounded by a membrane or capsule more or less thick, and lying immediately imbedded in the normal parenchyma of the gland, may be readily enucleated with blunt force, if the capsule can only be found, which in some cases proves the most difficult part of the operation. If the capsule of the nodes be situated superficially in the thyroid body, then the layer of sound thyroid tissue overlaying it may be very thin, and altered in its character so as to present the macroscopic appearance of connective tissue. In these cases it is nevertheless absolutely necessary to divide this layer in order to do the enucleation.

The exact method of proceeding differs in each case according to the number and location of the nodes. They may be attacked from the front or laterally, and either singly, each through a separate incision through the gland substance, or two or more may be enucleated by means of one single incision. The only hæmorrhage encountered during the operation is that during the incision through the parenchyma of the gland down to the capsule of the nodes. This may be controlled by the use of flat hæmostatic forceps; but during the enucleation of the nodes proper, there is very slight hæmorrhage, and this is easily controlled by compression. No large vessels enter the capsule, nor is there a pedicle or hilus to these nodes, requiring ligation.

This method has given excellent results in the hands of Socin as shown in the 50 cases published by Garre. The technique is easy of accomplishment; the operation is not a dangerous one; there can be no apprehension of secondary hæmorrhage, of interference with important nerves, or of tetanus or myxœdema—and it has been claimed, moreover, that the operation is not so disfiguring as some others. The wounds heal quickly with little danger of complication arising, such as acute thyroiditis, as the connective tissue spaces are not opened. Naturally, however, the operation is not applicable to all thyroid tumors, but only to those that actually present nodes on section, or, in other words, to all those forms of goitre which we have classed as *struma nodosa*. Inasmuch as this class is

by far the most frequent, we admit the usefulness of this method of enucleation; but we must bear in mind that this operation is not in any way possible in the class designated as struma hypertrophica or in any forms of malignant goitre. This operation has also been termed intra-glandular enucleation to distinguish it the more readily from the first described method of intra-capsular extirpation. The mistake is frequently made of attributing this method of enucleation to Juillard, who called his partial intra-fascial extirpation by this name. Porta, however, is said by Kocher to have operated by enucleation.

III. The so-called resection of goitre is an operation first described under that title by Mikulicz. Obalinski remarks that this method was practiced in 1871 in America by Green. The method is described by Trzebicky. The incision through the skin may be made along the anterior border of the sternomastoid muscle, or in the median line, with a second incision, if necessary, along the hyoid cornu. After having thus exposed the tumor, one of the lobes is freed from the surrounding tissue with blunt instruments. The superior thyroid artery and vein is then ligated, as well as the superficial vessels supplying the inferior portion of the lobe. The isthmus is now separated from the trachea by dry dissection, doubly ligated, and cut in two between the ligatures. The lobe is thus freed from its attachments in all but its lower part. Here it adheres to the trachea and œsophagus, lying in the angle between them, and covering the inferior thyroid artery (which is not ligated) and the recurrent nerve. This portion is now treated as if it were the pedicle of a tumor. It is divided longitudinally into several strands; each strand being compressed for a short space in hæmostatic forceps for the purpose of forming a groove for the ligature to lie in; a ligature is then applied to each strand and the tumor cut away. In case any further hæmorrhage should appear in the stump thus formed, transfixion ligatures are applied. The remaining stump should have about the size of a horse-chestnut and remains attached to the loose tissue uniting it to the trachea and œsophagus, and to the inferior thyroid artery and to the deep vessels attaching to the lower lobe.

The wound is now to be drained and sutured, and primary union is expected. In only one of twenty-one published cases did primary union fail; in nine cases out of twenty-three both lobes were removed in one sitting; in five, in two sittings. In the rest of the cases only one lobe was removed. In no case was there a recurrence of the malady.

Mikulicz claims for this method of resection that the recurrent laryngeal nerves are not exposed to injury. But Kocher frequently noticed sudden hoarseness due to injury to these nerves at the time of applying the ligature *en masse*.

IV. Amputation of goitre, as may be expected from the above description, differs very little from resection as to the parts removed, and the term "amputation," introduced by von Nussbaum, is only used to designate the technical fact, that the thermo-cautery is used to separate the tumor from the so-called pedicle, the tumor being well drawn out of the wound, but the pedicle remaining adherent to the trachea.

This method was used in cases of malignant, sarcomatous goitre only, where no other method was available. The division with the actual cautery was done slowly and cautiously, so that no loss of blood should occur. As much as one-quarter of the tumor was left *in situ*. The wound was left open in these cases and only covered with an antiseptic dressing. Very good results are reported to have been achieved by this method.

V. Evacuation is another method employed in the removal of thyroid tumors. It was first published under the title, "A Procedure to Remove Portions of Any Desired Size From Goitres Without Tamponade or Loss of Blood," by Hahn.

This author first applies ligatures to the superior thyroid arteries and to the thyreoidea ima artery, but places only hæmostatic forceps on the inferior thyroid arteries. In this way he hopes to prevent any serious injury to the recurrent laryngeal nerves.

He now splits the capsule of the gland and can now take out any desired portions of the tumor with the forceps and scissors. In this way he operates inside the capsule of the gland, first in the one lobe, and then, if necessary, in the other. This procedure can be done without loss of blood, provided

the small vessels in the capsule have been ligated at the time of its incision.

After sufficient diseased portions have been removed, the wound is treated by tamponade; but the hæmostatic forceps are left on the inferior thyroid arteries for the next twenty-four hours; and after the lapse of some further days secondary sutures are applied. Recovery is usually complete on the tenth day.

The advantages claimed for this method of evacuation are that the operation can be done without pulling or squeezing the gland, and without any injury to the recurrent nerve. But the placing of hæmostatic forceps upon the inferior thyroid branches needs to be done with equal care with that of a ligature. For should the nerve be caught in the grasp of the forceps, its function would be just as effectively interfered with as if caught in a ligature, even if the forceps were not to remain in place for twenty-four hours.

VI. A method not to be confounded with the one just described is Kocher's *evidement* for goitre. This is an operation very much resembling the enucleation described above as practiced by Socin, and like this latter method, is only adaptable to strumæ nodosæ. After proceeding as if for enucleation of the nodes, as soon as one of the nodes is reached, it is divided capsule and all with the knife into two halves; these are pulled apart, and each half separately removed from out of the surrounding tissue with the fingers or with a scoop. This can be done much more quickly than the above described method of enucleating the nodes, and herein lies its principal advantage. [We may compare these two methods of removing the nodes from goitres with two methods frequently practiced in the removal of sebaceous cysts from the scalp. The operation by which we first cut through the skin only, and then with blunt force take out the cyst with its sac entire, corresponds to the enucleation. The other method of cutting down upon the tumor from its apex to its base, through the skin and the sac and its contents, with subsequent removal of the growth, corresponds to the *evidement* just described.]

This method has also been termed evacuation, which term

is, in the opinion of the present writer, better limited to the operation published by Hahn. Bottini has claimed priority for this method of evidement, but Kocher insists it is original with himself.

VII. We must now mention a method which we may call temporary elastic deligation of the goitre (during enucleation), which was first described by Bose.

The incision extends from the sternum over the apex of the tumor; most frequently therefore running towards the angle of the lower jaw, upward and downward. The superficial fascia, the platysma and the muscles overlying the thyroid body are cut. The capsule of the gland is now laid bare and made free as much as possible on all sides, from the loose connective tissue surrounding it. One entire lobe of the gland is then pulled out of the wound as far as possible, and at the point where it passes through the incision in the skin, an elastic ligature of the size of the little finger is applied and drawn tight. The incisions are made and the nodes enucleated as described under the heading enucleation. The only difference between this and Socin's method being in the fact that here we have the advantage of a bloodless operation, especially when the dissection down to the capsule of the nodes is made, and can therefore perform it more leisurely, which is of importance in those cases where the tissue surrounding the nodes is thin. The hæmorrhage after removal of the constricting rubber is said not to be at all great, no tampon being necessary. In three cases only one artery had to be tied. The cavities are finally disinfected, a drainage tube placed in a dependent position, sutures applied to the capsule of the gland, to the muscles and to the skin all separately, and the dressing left on for two days. Care should be taken not to apply the ligature too close to the trachea, for fear of squeezing out the contents of the nodes.

A method published by J. Wolff and used by him successfully in three cases, which consists in treating the hæmorrhage by simple compression with iodoformized gauze during the enucleation of nodes—compression being maintained by the assistants at one point while the operation is progressing at another—has met with so much adverse criticism by experi-

enced operators, that it suffices to simply mention it here. The chief danger consists in secondary hæmorrhage, which may be brought about at any time by choking or vomiting on the part of the patient.

VIII. Within the past few years an operative method for the cure of goitre introduced by Wölfler has gained more and more notice.

This consists not in the removal of any portion of the tumor but simply in the ligation of the large arteries supplying the gland. The first successful case of ligation of these arteries was done in 1850 by Porta, although it had been previously theoretically considered by many surgeons. Wölfler's first case was published in 1886. He had tied both arteries of the one side for goitre and after seven months the part operated upon had diminished to more than half the original size, and the other half not operated upon had also become smaller. No gangrene occurs after ligation of all the larger arteries supplying the gland. Enough nutrition is still carried to it by the little *arteria crico-thyreoidea media* originating from the anastomosis of the superior laryngeal and crico-thyroid arteries of both sides. The collateral circulation is also supplied by the *œsophageal* and *tracheal* arteries.

Wölfler has given special attention to this point, and has examined microscopically a number of specimens obtained from the post-mortem table and after experiments on dogs. He has shown that coagulation-necrosis takes place and absorption occurs very slowly without any sloughing or gangrene. A slight elevation of temperature and icterus generally occurs after the operation, owing to the absorption accompanying the necro-biotic process. In case collateral circulation is too freely established after the ligation of the thyroid arteries, a recurrence may result. Generally, however, the tumor turns into a small mass of firm cicatricial tissue, after the lapse of one year and a half. The operation itself is of no avail in malignant disease of the thyroid body, but is especially applicable to those forms of goitre which we have designated as aneurysmatic or vascular goitres, and for gelatinous forms, especially when they are recent. Cystic or indurated tumors are not amenable to treatment by this method.

The technique of this operation is generally acknowledged to be very difficult—much more so than any method of extirpation of the tumor. Billroth speaks of the operation as interesting on account of its difficulties.

Wölfler gives several methods of performing the operation. We first consider the ligation of the superior thyroid artery. We here have two methods, the first of von Langenbeck, the second of Walther. In the first the incision through the skin is made parallel to the sterno-mastoid muscle over its anterior border, toward the thyroid cartilage. The artery is found lying immediately beneath the platysma and in the triangle formed by the omo-hyoid (in front), the digastricus (above), and the sterno-mastoid (posteriorly)—known as the superior carotid triangle of the neck—and may be here ligated.

Walther, however, has shown that these normal relations change, when one lobe of the thyroid gland is much enlarged in its upper portion. In this case the artery can be better reached at the anterior border of the omo-hyoid muscle.

Rydygier proposes to expose both superior thyroid arteries by one transverse incision.

We now turn to the ligation of the inferior thyroid arteries, the most difficult part of the operation.

The method of Velpeau, Porta (and Wölfler) consists in ligating the artery at a point just anterior to where it crosses the common carotid artery, between the latter and the tumor. Langenbeck and Dietrich advise its seizure at the anterior border of the scalenus anticus muscle, and, consequently, behind the carotid. To this end the initial incision is made between the two heads of the sterno-mastoid muscle; the internal jugular vein is to be laterally displaced, and then the anterior border of the scalenus located, care being taken to avoid the subclavian vein.

The third method is known as Wœlfier's method, and consists in tying the inferior thyroid at the point where it curves around and alters its course from the perpendicular to the horizontal (transverse), corresponding to the level of the carotid tuberculum; or else at a point about three-quarters of an inch below this one, on a level with the cricoid cartilage, and behind the former.

The incision is made on the side of the neck, between the two heads of the sterno-mastoideus, and externally (posteriorly, to the carotid). This incision extends from a point on a level with the cricoid cartilage downwards to the clavicle, and intersects the clavicle at the junction of the internal third with the external two-thirds of that portion of the clavicle situated internally to the delto-pectoral sulcus. The platysma is now divided, the veins crossing the incision, the *v. transversa colli*; the *transversa scapulæ*, and the external jugular vein are ligated, and the deep fascia is incised. In the upper part of the incision, which may be lengthened by splitting the sterno-mastoid still further upwards, the tendon of the omo-hyoid muscle now appears, and may be cut or pulled to one side. The border of the internal jugular vein now presents, and must be displaced internally, towards the median line. The pneumo-gastric nerve and the external border of the common carotid artery are now seen. The *scalenus anticus* may now be observed at the bottom of the wound, covered over with fascia, and laterally the phrenic nerve, which is to be pulled to one side. The anterior border must now be found, and here the posterior border of the inferior thyroid artery is seen and ligated. In this manner neither the subclavian vein nor artery are encountered.

Billroth's method somewhat resembles the one just described; but he makes the incision at the external border of the sterno-mastoid muscle; and the method ascribed to Drobnik by Obalinski also consists in seeking the artery through an incision along the external border of the sterno-mastoid, externally to the jugular vein, close to the *scalenus anticus* muscle.

Rydygier, who has performed the operation some sixteen times and with excellent success, advises the use of a transverse incision for exposing the inferior thyroid arteries. This incision is to be from three to four inches in length, parallel to the clavicle and just above it. It intersects the posterior border of the sterno-mastoid muscle, the smaller portion of the incision lying transversely upon the muscle itself. The incision is now carried through the platysma and the fascia of the neck, and the loose connective tissue under the sterno-

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mastoid muscle severed by dry dissection with the finger, until the interior border of the scalenus anticus muscle is well exposed in the wound. A blunt retractor is now used to displace the large vessels and the pneumo-gastric nerve together with the muscle, to the front, forward and inwards. The phrenic nerve may be seen coursing over the scalenus muscle. In the bottom of the wound the ascending and superficial cervical arteries are plainly visible at their point of origin, and the inferior thyroid may be followed for some distance in its curved course, and is here to be doubly ligated.

The two superior thyroid arteries may be ligated in a similar manner by a transverse incision, one incision serving to tie both arteries.

No drainage is used; and the first dressing is allowed to remain unchanged for three weeks.

One of the objections raised to the methods of ligating the thyroid arteries for goitre is that the operation causes four unsightly scars. But Rydygier, in two cases, made but two.

IX. Among the combined methods of operating for struma, we will here only mention Kocher's combination of resection and enucleation. This method is intended to be an improvement upon the resection of goitre as described by Mikulicz. As observed above, Kocher found, in ligating what has been called the pedicle of the tumor during resection, that injury to the recurrent laryngeal nerve was not always avoided, and in order to avoid this accident, and also to obviate the application of ligatures *en masse* to the stump, which may cause sloughing, he invented the following operation:

Supposing that one-half of the thyroid body was alone to be removed, and that the tumor could be classified under the heading of struma nodosa, the anterior surface of the goitre is first laid bare, and the tumor, as far as possible, made free by dry resection with blunt instruments. The veins are doubly ligated and cut, the superior and inferior thyroid arteries ligated with their veins in the same manner as described for extirpation. But in case the whole lobe is not to be removed, and it is desired to maintain the normal function of the gland, this step may be omitted. The isthmus may now be ligated; or this, too, may be omitted as unnecessary.

The tumor is now attacked from the front, at a point as near as possible to the median line, and the thin coat of parenchyma cut through until the capsule of the node is reached. The dissection now follows the median aspect of the superficialis of the node until a point has been reached behind the point of attack, and well past the region where the recurrent laryngeal nerve lies in the groove between the trachea and the œsophagus. At this point, well out of the reach of the œsophagus, and at the posterior portion of the tumor, the layer of parenchymatous tissue enveloping the node is again attacked and cut through, and the incision carried downward and, so to speak, around one of the segments of the node, until it meets with the original point of attack from the front. As soon as this is done the node with its greater external portion covered with parenchyma comes away, being only adherent in its place by the untied vessels coming from behind, if there remain any untied; in this case these are now to be tied and the tumor removed. A cup-shaped portion of the gland is thus left in connection with the isthmus. The only time when hæmorrhage may be encountered is during the incisions through the parenchyma down to the capsule of the node, and then each bleeding point should be tied as it is encountered—unless the bloodless operation is done.

[The whole operation may be illustrated by imagining an orange cut away from the tree on which it is growing by incising the rind in front, at a point say an inch from the stem, in a line at right angles to the stem, then stripping off the portion of the rind near the stem from the pulp by blunt force until a point is reached two inches from the stem measured behind the orange, and, lastly, incising the rind at this point from the inside, and then joining the incisions. In this illustration the stem of the orange represents the isthmus, the rind the parenchyma, and the fruit proper, the node.]

This is Kocher's "resections-enucleation" and his operation of "resections-extirpation" is similar, the latter referring to the class of cases where no nodes are developed. In either case a mass of tissue is allowed to remain *in situ*, which should have been removed if surgical extirpation had been done. In fact both these operations bear upon them the stamp of improvisa-

tions during operations commenced after typical methods.

Having thus far reviewed the principal methods in vogue for the operation of thyroidectomy it is of some importance to determine, if possible, which method is best adapted to certain given cases. From their nature it is evident that many of the operative methods described are only applicable to certain forms of tumor. Thus enucleation can only be done for struma nodosa. Ligature of the afferent vessels is especially adapted to recent aneurismatic tumors. But the indications as to the choice of methods given by the appearance of the various tumors are by no means completely covered by such *a priori* considerations, and therefore much time and attention has been given by various authors to this interesting question.

The choice between partial and total excision of the thyroid body has been brought into greater prominence and received more serious consideration since the development of our knowledge of the disease called myxœdema.

It is well known that in certain cases of complete removal of the thyroid body, death occurs, preceded by a condition of the skin and other tissues of the body resembling œdema, but for the greater viscosity of the infiltrating fluid, owing to the presence in the latter of mucin.

The subjective symptoms of operative myxœdema consist in a sense of fatigue and lassitude, sleeplessness, deep-seated pain and chilly sensations in the limbs, gradual loss of memory and intelligence, difficulty of speech, palpitations, etc. Objectively, we find an œdematous condition of the skin, especially of the face and hands, not pitting upon pressure, and giving to the physiognomy an expression of idiocy; also a swollen condition of the mucous membranes with increased secretions, giving rise to various disorders; swelling of the tongue, etc. Anæmia is always present, and generally well marked. Sensibility is impaired; paræsthesia, neuralgia or anæsthesia may be present. The reflexes are generally diminished. All movements are labored, and disorders of co-ordination may exist. The pulse is small and soft, the circu-

lation slow, the temperature subnormal. Disorders of digestion are frequent. The urine is generally diminished in quantity, of subnormal specific gravity; in the latter stage nephritis and albuminuria are present. The memory becomes impaired; speech grows slow and labored; illusions of the senses and hallucinations occur.

The course of the disease is slow but progressive, generally lasting from six to twenty years. The first symptoms may appear after the lapse of a period of three months after operation. Death is occasioned by inflammatory changes in the lungs, nephritis, pericarditis, hepatitis, etc.

A large number, some 150, of cases of myxœdema are now on record, and where the disease appeared of its own accord, it has been ascribed to the interstitial development of fibrous tissue in the gland. In operative cases the disease was ascribed directly to the removal of the gland.

It is a curious fact, however, that some surgeons, and they not by any means such as have done the least number of total excisions, as Maas and Billroth, have never observed cases of myxœdema in their practice. The latter consequently once expressed himself as not believing that myxœdema was a consequence of total extirpation of the gland, while Maas believed the condition called myxœdema to be due to the same (miasmatic) infection which first caused goitre.

This latter view is refuted, however, by the observation frequently made since then, that myxœdema exists in districts where goitre does not occur, and in patients who never had visited such districts.

Baumgærtner and other surgeons believed the disease due to injury to the sympathetic and recurrent nerves during the operation, and consequent loss of oxygen to the brain.

Munck attributed it to irritation of the nerves encountered in the field of operation proper. But Hoffa, who, after first doubting its existence, was obliged to acknowledge it, after having observed a case in his own practice, argues that these theories would not explain why myxœdema occurred only after total and not at all after partial excisions. On the other hand it has been argued that if some surgeons did not observe myxœdema after total excision of the thyroid, that was proba-

bly either because the excision was not so complete and entire as they had believed, or else on account of the presence of accessory thyroid glands which had been overlooked, or finally, because the cases had been lost sight of and had not remained sufficiently long under observation.

Quite recently the Myxœdema Committee of the London Clinical Society, under the chairmanship of Dr. Ord, has handed in its report, after four years of labor, which renders it extremely probable that the disease of myxœdema is a direct consequence of the loss of function of the thyroid gland. In the operative cases, the committee was persuaded, the operations had been done with perfect antiseptic precautions. The final cause of the disease therefore, still remains obscure.

We have, however, by the present time numerous experiments upon animals, which throw a little more light upon these obscure conditions.

In dogs and cats loss of the entire thyroid causes death. Rabbits and rats, however, sustain loss of the entire thyroid body without any evil consequences. Apes show much resemblance to man in their behavior after being subjected to loss of the thyroid. They are attacked by muscular tremor, mucoid œdema, and idiocy, and die.

Some very interesting experiments have been performed upon cats. After removal of part of the thyroid, the excised portion was transplanted into the abdominal cavity, and in some cases it became organized and apparently continued to functionate in its location, so that the animal survived the subsequent total extirpation of the gland at the neck without any symptoms of cachexia. The gland in the abdomen was found to have become considerably smaller on subsequent examination, than when first introduced.

Transfusion of blood from a healthy animal into one suffering from operative myxœdema retards the progress of the disease; the same effect is observed after injections of the juice expressed from a healthy thyroid body. After the extirpation of the thyroid larger quantities of mucin have been found in the saliva of the submaxillary glands than normally. The names of Schiff, Wagner, Zesas, Sanquirico and Canalis, Horsley, Herzen, Albertoni, Tizzoni, Colzi, Ewald, Halstead

and others, are connected with experimental research on these questions.

As to theories which have been advanced to explain the function of the gland, there is no lack of them.

The possibility of the thyroid being a regulator for the blood-supply to the brain has been very ably sustained by some work done in His' laboratory. When we recall the anatomical fact that both the internal carotid and the vertebral arteries have a tortuous course through bony canals before entering into the cranial cavity, and that both these arteries are directly influenced as to their blood supply by the thyroid arteries, it appears plausible that the thyroid body, acting as a sponge for the instantaneous receiving of large quantities of blood, may so regulate the blood pressure in the brain as to be necessary for the proper function of this organ, especially when we bear in mind the nervous distribution to the gland. But ingenious as this theory is, it cannot readily be brought into harmony with the observations of the vicarious function of thyroid grafts for the normal gland observed by Schiff in cats.

Other theories ascribe to the gland the function of the production of blood-elements, or the destruction of some noxious element in the blood-fluid; or the furnishing of some unknown secretion necessary to the system or to the proper function of the nerves; or the supplying of some unknown and important nervous fibres belonging to the sympathetic system.

The theory apparently the most probable is that of Horsley, that the gland prevents the accumulation of mucin in the system; this being the best substantiated by experimental evidence.

However these questions may be decided in the future, this much is certain in view of the present state of experimental research—that total excision of the gland is not justifiable, if it can be avoided in the interest of the patient's life. Therefore total removal of the thyroid body should never be undertaken, excepting in such cases as malignant goitre, carcinoma or sarcoma. In some cases, however, an acute inflammation of the enlarged thyroid body is met with, which is a complication of goitre (known as thyroiditis). In these cases the

patients are not only exposed to the most acute suffering but they are in actual danger of their life from suffocation. In these cases, therefore, unless the goitre be cystic in character, total extirpation is called for.

In all other cases, however, partial excision only is justifiable, the excision being limited to one-half of the organ, otherwise enucleation of nodes or resection being done.

The method preferred in each case will be best decided by the diagnosis.

If we have to deal with a simple form of struma nodosa—and this is the most frequent case—we elect the operation described as enucleation. In fact, some authors propose attacking every case with a view to performing enucleation of the nodes, taking their presence for granted; and only when this method fails, do they secondarily resort to other methods (resection).

If we recognize large hard nodes situated in a thyroid body which has become adherent to the underlying tissues, and cannot be manipulated without danger of suffocation to the patient (on account of the undue traction on the trachea, softened by pressure), enucleation is indicated. But if the nodes are of a softer and more vascular character, so that much hæmorrhage is encountered on enucleating in consequence of the arteries leading into the capsule being too numerous, evident is the quicker and cleaner method. Especially is evident to be substituted for enucleation in case one of these soft nodes should be ruptured during the operation. The presence of adhesions between the tumor and the softened trachea, therefore, materially affects the indications, since these conditions frequently render dispatch imperative. For these reasons very hard nodes which cannot be easily detached from the surrounding tissues may also be more readily removed by evident.

Now, it may happen, in case enucleation is undertaken, that the nodes prove to be present in very great numbers, although individually of small size, so that in spite of the fact that the proposed enucleation may prove sufficiently easy of performance, the time necessary for the completion of the operation proves too long. In such a case, too, evident permits of

more rapid work, and should be substituted for the enucleation, especially when the nodes are well isolated, so that little hæmorrhage occurs on splitting them. But if the nodes are extremely small, and present in great quantities, partial extirpation is the quickest and most satisfactory method.

For vascular hyperplasia of the thyroid gland as described above, whether it appears in the aneurismatic or varicose form, deligation of the large arteries supplying the gland should be undertaken. If the condition is more prominent on one side, both the superior thyroids and one inferior thyroid artery may be ligated in the first sitting, and only in case prompt recovery does not result need the other inferior and ima be tied. The reason for this delay lies in the fact that some surgeons (Kocher) are fearful of the occurrence of myx-œdema after ligation of all arteries. These considerations, together with the technical difficulty attached to the deligation of the arteries, have combined to discredit the performance of this operation for parenchymatous goitres, for the softer and more recent forms of which it was formerly considered indicated by some surgeons.

For the cases described above as hypertrophy (and especially where we encounter diffuse hypertrophy, a proliferation both of the parenchyma and the interstitial tissue), partial extirpation is indicated, provided that a portion of the gland is unaffected, and may be left *in situ*. If not, resection is indicated.

There may occur cases in which it is impossible to make a diagnosis, and when the surgeon remains in doubt what he has to deal with. In such cases, resection is indicated, because this method is generally safe; there is no need of an exact knowledge of the condition of the other lobe—nor is it necessary to ligate the inferior thyroid artery, nor to dissect out the recurrent nerve.

One class of goitres has not as yet been considered in the foregoing pages—the cystic goitre. We refer especially to those cases where one large cyst is responsible for the increased size of the gland. The operations for cystic goitre are several: Puncture with injection of some medicinal fluid; inci-

sion, with subsequent stitching of the sac to the skin, and drainage; enucleation of the sac entire; these are the methods most frequently in use at the present time. Of the methods in which iodine tincture plays a part little need be said, on account of the loss of favor which this procedure has met with since the introduction of more rapid methods. Although a number of cases are still reported in the journals, where recovery takes place after iodine injections, yet many cases of mishaps have also been published. Hæmorrhage ending in death, acute inflammation with suppuration, acute asphyxia with fatal result, are among the published consequences following iodine injections. In any case the use of injections of iodine causes adhesive inflammations to take place about the sac, and this condition renders subsequent operations by rapid methods very difficult or impossible, not to speak of the valuable time lost.

The objections which may be raised to the method of operating upon cystic goitres by incision with parietal suturing and drainage, sometimes spoken of as Beck's method, are, first, the liability of hæmorrhage occurring from the middle of the cyst. We know that the villi projecting into the lumen of the sac contain quite large blood vessels, and that degenerative processes are constant here. In fact, as remarked above, it is not improbable that these cysts originate and grow by means of hæmorrhages. The second objection is the length of time necessary to complete recovery after the operation, especially if the capsule of the cyst is much thickened. These objections do not hold good in regard to operations done at an emergency for threatened asphyxia, when the incision, or even aspiration, is sure to give instantaneous relief—a method frequently called into use on account of the proneness of large cysts to acute inflammations.

The favorite method of operating for cysts, and a very easy and rapid one, is the enucleation of the sac entire. This method has been associated with the name of Juillard, Burckhardt, E. Müller and others. The finding of the sac is not difficult, owing to its thickness, and the course of the blood-vessels on its walls, referred to above.

The incision through the skin may be made along the anterior border of the sterno-mastoid muscle, or in the median line, according to the location of the cyst. The fascia covering the gland is first incised, and then the layer of parenchymatous tissue intervening between the capsule of the gland and the sac of the cyst is to be cut through. Here some hæmorrhage may be encountered and should be arrested as one proceeds. This layer may, however, be extremely thin, like blotting paper, and may more or less resemble connective tissue, owing to atrophy from pressure. When the capsule of the cyst is reached it is easy to enucleate the whole sac complete. Care should be taken not to rupture it, in which case it is best to split the cyst open and afterwards dissect out the capsule.

The wound should then be closed in the usual way; and recovery is generally completed in two weeks on the average.

In conclusion, we may now present the choice of a method of operation for all kinds of goitre (excepting exophthalmic goitres) in the following manner:

Large nodes in simple goitres: enucleation; in case this operation proves impracticable, resection is to be substituted for it.

Nodes in immovable goitres, where there is some danger of suffocation: enucleation; in case the danger increases, evidentment is to be substituted.

Very soft nodes in simple or immovable goitres: evidentment (for the sake of dispatch).

Large number of small nodes: partial extirpation. If no sound tissue is present which may be left, resection is to be substituted.

Vascular tumors: ligature of arteries.

Cysts: enucleation.

Diffuse hypertrophy: partial extirpation; if no sound tissue is present which may be left, resection is to be substituted.

Malignant goitres: total extirpation—for which amputation may be substituted.

Acute thyroiditis in simple goitre: total extirpation.

Acute thyroiditis in cystic goitre: enucleation; if dispatch is necessitated, incision and drainage may be substituted.

When the nature of the tumor is not diagnosed, or if the chosen operation proves impracticable, resection.

Injections are to be reserved for cases where from one or other reason an operation is not deemed advisable.

Of the many fluids proposed for injection, iodine tincture, Lugol's solution, arsenic, ergotine, Fowler's solution, osmic acid and iodoform, the latter appears most worthy of trial since its warm recommendation by von Mosetig-Moorhof. The method was used principally for soft parenchymatous or follicular goitres and gave excellent results. The solution consisted of iodoform, one gram; and ether and olive oil, equal parts, seven grams. One or two grams or more (℥xv-xxx) were injected in intervals of from three to eight days, in all from five to ten times.

The indications for operative interference in goitrous tumors have been given as follows:

1. Suffocatory symptoms.
2. Difficulty of respiration; even when labored respiration only appears after exertion.
3. Rapid growth of the tumor.
4. Difficulty in swallowing.
5. Interference with the patient's usefulness, or his enjoyment of life. (Maas.)

Age does not form a contra-indication to the operation.

The complications which may occur during operation are: (1) hæmorrhage; (2) gross lesions of the nerves, especially the sympathetic, the pneumo-gastric, the hypoglossal, and the recurrent laryngeal nerve, (3) injuries to the adjacent organs, especially the œsophagus and the trachea.

Those directly following are (1) the inflammatory or (2) septic complications; such as aphonia due to tumefaction of the mucous membrane, and acute suppuration of the visceral space of the neck, with cellulitis and consequent burrowing of pus and anterior mediastinitis.

Among the more remote consequences of thyroidectomy are (1) acute mania following operation; (2) epilepsy; (3) tetany; (4) hysteria; and (5) myxœdema; (6) recurrence of malignant tumors *in loco* and elsewhere, with adhesion of the capsule to the growth, envelopment of the large veins of the neck and the nerves in the growth, extension below the sternum, etc. These complications and sequelæ of thyroidectomy are to be treated according to general surgical principles, so that their mere mention suffices here.

The question regarding the advisability of performing tracheotomy in cases of thyroidectomy has been answered in the negative by almost all operators of experience; and the operation is only done at the present time during the excision of goitre to meet a vital indication. It is hoped by carefully avoiding tracheotomy to insure a more certain condition of asepsis in the wound, which could not so readily be done were the secretions from the mucous membrane of the trachea allowed to enter the wound.

If tracheotomy is not done, however, much care is to be bestowed upon the trachea during operation, and especially when by compression through the tumor it has become changed in shape and rendered soft. Two sutures are frequently inserted, one in either side of the trachea, and traction maintained upon them during operation, so that the tube is prevented from collapsing with the movements of the tumor. Or else the sutures may be tied together over the front of the trachea, with a view to maintaining its lumen oval. The sutures should not be passed through the mucous lining of the trachea, but only below the cartilaginous rings.

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EDITORIAL ARTICLES.

SOME RECENT SCANDINAVIAN CONTRIBUTIONS ON TUBERCULOSIS OF THE KNEE-JOINT AND ITS SURGICAL TREATMENT.

1. *Emil Müller.* Om Arthrektomia Genus ved Tuberkulos Arthrititis. (On Arthrectomia Genus in Tuberculous Arthritis.) Inaugural Dissertation. Copenhagen. 1889. 281 pp.

2. *Hagb. Ström.* Knæledstuberkulosens og dens Kirurgiske Behandling. (Tuberculosis of the Knee-Joint and its Surgical Treatment.) Christiana. 1889. 167 pp.

3. *Prof. Plum.* Bør Arthrektomi eller Resektion foretrækkes ved den tuberkulose Gonitis hos Børn? (Is Arthrectomy or Resection to be Preferred in the Tuberculous Gonitis of Children?) A Lecture before the Copenhagen Medical Society. Hospitals—Tidende. Jan. 8, 1889.

4. *Gabriel Tryde.* Om Iodoformgaze-Tamponade og Sekundær Suture ved Resectio (eller Arthrectomia) Genus for Arthrititis Tuberculosa. (On Iodoform-gauze Tamponade and Secondary Suture in Resection (or Arthrectomy) of the Knee for Tuberculous Arthritis.) Hospitals—Tidende. Dec. 3 and 11, 1889.

The simultaneous appearance in Scandinavia of several contributions upon tuberculosis of the knee-joint is indicative of the interest which this subject is exciting in the northern European countries.

1. Dr. Müller has somewhat limited his work as he nearly exclusively treats of arthrectomy, considering, however, its relation to resection of the knee-joint. He first goes through the history of arthrectomy and presents a distinct picture of the course of its development. Then the various opinions expressed in the literature on the functional results, the question of a moveable joint and the different opinions for and against the operation are presented. He holds to König's¹ views

¹König. Die Tuberkulose der Knochen und Gelenke.

on the pathological anatomy of the joint disease. The clinical picture is given a very short consideration. After a schematic synopsis of the 42 cases of arthrectomy of the knee-joint taken from the large Danish hospitals for the last four years, he describes the technique of the operation, partly from the literature and partly from his own material. The various methods of opening the joint are presented and criticised, as well as the after treatment, after which he treats of that which is the real subject of his investigations, the results of arthrectomy with regard to the dangerousness of the operation to life, to radical cure of the affection and the functional results obtained. As to the dangerousness of the operation he first mentions the danger, pointed out by König, in operating on tuberculous joints, of an outbreak of universal miliary tuberculosis from direct inoculation during the operation. This danger, he thinks should be considered along with the question whether in a given case one should operate or treat conservatively. In one of his cases death was probably due to such an inoculation tuberculosis, but the case was not clear as the healing process of the wound was complicated by gangrene of the skin flap and deep suppuration. On the other hand he thinks one is somewhat justified in taking the views in case of an operation that possibly by removal of the tuberculous focus one may ward off the danger of a later general tuberculous infection. He closes by saying that arthrectomy of the knee presents no dangers for the life of the patient, neither in the operation itself nor in the after-treatment, for out of 42 cases of his, 2 only ended fatally and death in neither of these cases can, directly or indirectly, be said to be due to the operation. For this reason he places arthrectomy above all the other procedures and would give it considerable preference over the conservative treatment. The length of time of treatment is of essential importance; he especially emphasizes that in his cases it was, on an average, 7.3 weeks, but that when uncomplicated the period was much shorter, so that many patients would leave the bed after 6, 4 and even 3 weeks.

With regard to the other questions, how far arthrectomy is able to cure the local affection, the writer makes a comparison with resection which, however, is an unfortunate attempt as he does not have at his

disposal a corresponding number of cases of resections treated according to the same method as his arthrectomies. He cannot use for this purpose the 45 cases of resection collected by Ipsen as many of them were not treated according to the principles generally accepted in arthrectomy and resection. On page 113 he says; "The two operations offer about equally good chances for a cure of the joint disease." It seems that he comes to this final conclusion from a comparison of his arthrectomies, which gave 66.7% of cures, with newer statistics on resection from other countries having a percentage of 71 to 77%. But here the writer regards his own cases with a little too much favor for he has reckoned among the 66 7% of cures after arthrectomy, not only those which were cured after more or less grave operations but also partly cases where, on account of the short period of observation, and the lack of later information, he was obliged to class them as "cases with an uncertain result." In some of these the period of observation after the operation was so short that he cannot draw any definite conclusions now. His expression that the two operations seem to have, with regard to cure, about the same results, directly conflicts with that which he gives as the result of arthrectomy. For, when among 41 cases he only finds 15 without any recurrence, in contrast to 26 with a recurrence, and where the greatest part of these were of such a nature that in 10 cases a secondary resection was necessary, it is scarcely the best proof of the correctness of the *a priori* assumption that resection stands somewhat above arthrectomy with regard to the radical removal of all the diseased tissue. Also the possibility that in arthrectomy osseous foci which have not reached the surface might be overlooked finds a confirmation in the writer's cases for he admits that in 8 of his cases this was true.

The writer divides his cases into 4 groups in considering the question: In how many cases one may assume to have approached a radical extirpation of the diseased tissues by arthrectomy, oblique or longitudinal incision with or without severing of the ligaments. Such a division seems hardly justified as his cases are extremely limited in number and it would not lead to any definite results, whether the ligaments were severed or not when no regard was paid to the extent in

which the disease presented itself at the operation. In general one may assume that the surgeon in a given case will remove and in another preserve them, his method being dictated by the extent of the disease. Indeed arthrectomy is nearly an atypical operation where one decides by the greater or less extension of the diseased process with regard to the extent of the operation.

In the third chapter he gives, under the functional results after arthrectomy, a clear review of the various factors which play a role after resection. Then he states the results of 18 arthrectomies performed upon 18 children, who varied in age from 2 to 16 years. In the greater part of these shortening was not to be noticed, or, if present, it was so little as to have no essential influence upon the function; and, what is more important, in 5 cases he noticed a distinct prolongation of the extremity operated upon; in 2 cases it reached 3 cm. The most interesting are his results as to the adhesions between the ends of the bones after arthrectomy. Among 25 cases, with regard to which the writer was able to get information on this point, he found, 17 times, flexion—as, a rule, not to a great extent—while only 8 patients presented a completely extended knee. Of these 8 there were 6, perhaps 7, which had obtained an active mobility, while this was only the case in 1 of the 17 with a flexion contracture. This, he thinks, points to the muscles being the chief factors in the origin of the contractures. After having described the relations which most probably have an influence upon the later functional result, he ends his treatise by saying that the conclusion seems justified that one must be insane to want to induce ankylosis after arthrectomy. It is very probable that in many cases where there is incomplete ankylosis, by the employment of baths, massage, electricity and passive movements, quite an active mobility might be obtained, and this, he thinks, will be the treatment of the future.

2. Dr. Strom has given his work a much broader scope, as he presents a clear and concise picture of tuberculosis genus and its treatment, based upon about 200 cases of tuberculous gonitis treated in the "Rigshospital" in Christiania from 1873 to 1887. His presentation of the disease is grounded upon the works of Köster, Hüter, König and

several others. This material is carefully examined with reference to the age and sex of the patient, and the various ætiological factors. He presents the pathological anatomy according to König and Volkmann. He divides his cases into 4 principal forms: 1. The fungous form (the former tumor albus); 2, the form described by Volkmann as caries sicca; 3, the tuberculous hydrops and cold abscess of the joint. He mentions the varying frequency, course and prognosis of these forms, basing himself upon his cases, and emphasizing especially the clinical and prognostic importance of beginning suppuration. He, by means of a series of detailed statistic calculations, demonstrates how the clinical form under which the disease appears will always be one of the decisive factors when, in a given case, one is to give the prognosis and decide as to treatment.

In the second chapter, the surgical treatment of knee-joint tuberculosis, he considers the question of the primary and secondary origin of the disease, and the practical consequence with regard to the indications for operative procedure. Here he is inclined to place himself in opposition to König's views, as his material seems to justify the opinion that we are best able to reduce the mortality of universal tuberculosis by operative procedures, which completely eliminate the local focus in the joint. The danger of inoculation of miliary tuberculosis, by the operation, pointed out by König, he thinks, in a great degree exaggerated by the latter and Wartmann. He then investigates especially the results of the various methods of treatment and their indications. An exclusively non-operative treatment was employed in 63 cases; of these the results were known in 56 cases, which gave a percentage of 66 (37 cases) entirely cured. But the writer emphasizes correctly that this percentage is misleading; if one will have a correct expression of the results of expectant treatment, then one must also include all the cases where it failed, and where an operation was necessary later on account of this. By this method he finds that 27.5% of the number of cases treated has been cured by exclusively operative treatment. This method was very much employed in children, and has given the best results in those groups where the age varied between 5 to 10 and 10 to 15 years. It was especially employed

in those cases which appeared under the picture of caries sicca; a particularly unfavorable result was obtained in tuberculous hydrops. The functional results hereafter cannot be called good, for out of 37 cases only 2 had good motion of the joint, 2 some motion and moderate contracture, and the rest ankylosis, with more or less flexed knee.

A series of minor operative procedures, as puncture of the joint with antiseptic erosion, arthrotomy with erosion and partial extirpation of the capsule have not given encouraging results. The outcome was especially bad after puncture of the joint in tuberculous hydrops. But here he remarks that these partial operative procedures were especially performed in elderly individuals, entirely contrary to the views of most modern surgeons, *i. e.*, that partial operative procedures are indicated in childhood, as one may reckon upon the natural tendency to heal, while diseased processes in adults are inclined to maintain their destructive character. But he also thinks that these partial operative procedures are in many cases unnecessary, and merely complicate the condition. Even where a recovery has taken place afterward he assumes more probable that the operative procedure had no essential influence upon the course of the disease. Here he is directly opposed to Ollier who has obtained excellent results with partial operations in young patients. Also with regard to the functional results his few cases do not speak in favor of this treatment; ankylosis has been the regular outcome. Ignipuncture is given a mere mention on account of the good results which French surgeons have obtained with it, and their unanimously favorable views on this measure; he has had no personal experience with it, and it seems to be as little used in Norway as in Denmark. Arthrectomy and resection are given as the real operative procedures to be used in knee-joint tuberculosis, as they give full access to the joint, and permit the total extirpation of all the diseased tissue, which, indeed, is the chief object of the operative therapy. The advantages and disadvantages of the two operations are considered. In all the writer has 12 arthrectomies and 66 resections at his disposal. Although after resection the results seem to have been better than after arthrectomy, especially if one uses the resections which were performed after 1882, during which time antiseptics was carried out, as

well as was the careful removal of all the diseased tissues done as a rule, yet his material does not allow of a definite conclusion on the value of arthrectomy or resection, partly, because of the small number of arthrectomies, and partly, because of their being done by a less complete method—by double lateral incision. On the whole, he is more in favor of resection which, in his cases, has given 67.5% definite cures, confirmed after many years. In any case, resection should be performed in adults; in children, the question he regards as still open.

Finally, amputation of the thigh is considered, together with its indications in tuberculous gonitis. In general, amputation of the thigh may be said to be indicated when by no conservative method can a serviceable extremity be made for the patient and where there is a prospect of securing the patient from the secondary consequence of the disease, or where there are already signs of this to prevent its development. More especially does he consider the question of amputation in relation to the age of the patient. He would find an absolute indication for primary amputation in cases which originate or come under treatment at the age of 50 to 55 years for then one cannot expect to obtain a sufficiently solid consolidation. At this age the disease develops so rapidly and leads so quickly to suppuration that great destruction of the joint must naturally ensue.

Amputation may be contra-indicated in the individual under 20 years; one such case is mentioned where the general condition of the patient, which was complicated with tuberculosis of various organs, necessitated the sacrifice of the limb in order to save his life. The relations are, however, different in patients between the 20th and 50th years, for here a persistent suppuration more rapidly has an influence upon the general conditions and internal complications manifest themselves more early.

If the suppuration cannot be removed by resection, or the pus has burrowed to such an extent that an extensive tuberculosis of the soft tissues has resulted, then amputation is inevitable. The same holds good with extensive complications of the internal organs as resection

presupposes a process of reparation which places greater demands on the patient's vitality than one can reckon upon.

3. The speaker gives the history of the origin, course of development, and the present standing of arthrectomy, defining the essential points of the operation and reviewing the results of individual operators. The nomenclature of the pupil of Volkmann, Heidenhein, is referred to. The results of a Danish surgeon, Iversen, who appeared as a warm defender of arthrectomy after 5 observations, are mentioned. These were mentioned in a lecture before the Copenhagen Medical Society (*Hospitals Tidende*, Nos. 16 and 17, 1885). He then calls attention to a result which he has noticed in two of his cases, namely; a lengthening of the extremity after operation. He thinks that when conservative treatment does not prevent the further encroachment of tuberculous gonitis, the operation should, as a rule, be performed that: 1, as far as possible all diseased tissue be removed thoroughly and lastingly, and, 2, a good ankylosis in a desirable position be made so that the limb may be a desirable support to the body.

In the removal of the diseased soft parts he obtained the best results from his arthrectomies as the cases healed by first intention without any fistulæ, in the course of a few weeks. If the capsular disease is extensive, especially back towards the popliteal space, then a complete opening of the joint with severing of the lateral ligaments, and in some cases partial removal of the crucial ligaments, were necessary. As to the removal of all the diseased tissue the two operations were equal in value, if in arthrectomy we cut through the lateral ligaments and render the posterior portion of the capsule accessible. As to the production of ankylosis in a desirable position, he regards this as a weak side in the operation of arthrectomy. For the patient, after leaving the hospital with the limb in a stiff bandage, notices a bending with an abrasion of the skin on the front of the knee, and for this reason children after this operation have to be bandaged and kept continually under surveillance.

In two of his cases operated upon in 1886 he observed a peculiarity which has made him have less confidence in arthrectomy, namely, the

prolongation of the extremity operated on mentioned before. The long and stiff extremity is a continual annoyance to the patient. A simple elevation of the pelvis on the affected side does not smooth out the matter, but causes the bending and valgus position of the piece, seen in such patients, to become worse. This prolongation is due to the congestion and increased development of the blood-vessels in the epiphysis as a consequence of removing the capsule so near the epiphysis.

Prof. Petersen, of Kiel, is cited as having communicated a similar case, but in his case the lengthening lessened and in the course of a few years the limbs were entirely equal, and indeed some shortening followed. Hence the writer has abandoned arthrectomy in children for resection; he never has tried the operation in adults. When he does not advise arthrectomy he means only total arthrectomy, which requires a complete opening of the joint. Partial extirpation of the capsule might be tried in some cases, in the beginning of the disease. Shortening does not occur to any great extent after resection; he thinks the dangers of this are much exaggerated, for he has seen an osseous union take place even in quite young children. When shortening does take place he considers it due to an improper adaptation or union of the surfaces, so that an osseous union does not form by first intention or to an improper treatment of the wound. After inter-epiphyseal resection the resected extremity keeps good pace, as a rule, with the development of the other. For the last ten years he has several times resected by this method, and has seen the resected limb grow and leave nothing desired in its functions. A slight evidence of shortening is present, as a rule, but this is a necessity for the free and easy use of the rigid limb, and if quite noticeable it may be removed by a thick sole.

If in resection it is necessary to go above both epiphyses, then quite a shortening is to be expected, but the limb cannot be purchased at a less cost and such an extremity is to be preferred to a thigh amputation stump. But such a resection is very seldom required. In general a couple of discs sawed off, without, however, nearing the epiphyseal line, are sufficient; then from here one may dig and chisel out

the diseased tissue, thus getting the same results as in arthrectomy. If one condyle be more diseased than the other, then it may be cut off obliquely and the other sawed off in the opposite direction to correspond.

Finally he advises in the tuberculous gonitis of children the employment of resection in preference to arthrectomy and its performance as follows: After careful cleansing and the application of Esmarch's bandage to the thigh: 1, a transverse incision over or through the patella and complete opening of the joint; 2, horizontal epiphyseal sawing of the condyles, removal of all the diseased tissue possible with the chisel; 3, total extirpation of the capsule and all the soft tissues diseased; 4, ligation with catgut of all the larger and smaller vessels; 5, careful co-aptation of the osseous surfaces, they to be held in position by means of two long nickled steel wires, introduced from one condyle and passed obliquely down and over to the opposite tibial tuberosity; the other in the other direction from the opposite condyle; 6, a short drainage tube into each corner of the wound; the outer wound being united by means of the continuous catgut suture; 7, the wound then is to be covered with glass-wool, upon which a sublimate-wool pad is to be applied with compression; 8, Esmarch's bandage is then loosened; 9, the thigh and dressing are then wrapped in cotton and two concave lateral splints of pasteboard are applied and then a posterior Gooch's splint and an anterior suspension splint, which is also applied with a stiff bandage. The limb is kept elevated from 12 to 24 hours, and then is lowered according to the desire of the patient. After a month the bandage is changed, the sutures and drainage-tubes removed, and a new stiff bandage applied, after which the patient may get up and about on crutches. The stiff bandage is kept on the first half-year, after which it may be changed once or twice.

4. The writer, from a series of observations made in the "Kongelige Fredericks Hospital," with regard to the question whether iodoform-gauze tamponade has any influence upon the course of arthrititis tuberculosa after operation, concluded that it only influenced recurrence and the frequency and intensity of secondary infection in so far

as it induces healing by first intention in many cases, and especially in those where the wound is extensive.

The number of days that the patients were under treatment was also very much reduced, especially in those where the wound healed by suppuration. Finally he concludes that this method gives better results than the treatment generally used.

F. H. PRITCHARD.

INDEX OF SURGICAL PROGRESS.

OPERATIVE SURGERY.

I. **A New Method of Performing Gastrostomy.** By Prof. EUGENE HAHN (Berlin). In June, 1887, Hahn first performed gastrostomy through the eighth intercostal space. Since that time he has performed 8 operations by this method in all, and comparing this with 7 cases operated upon previously by Fenger's method, expresses himself as being decidedly in favor of the former. His method is as follows: An incision is made parallel with the lower edge of the last lower rib, and the abdominal cavity opened. A second incision is made in the 8th intercostal space, close to the juncture of the 8th and 9th intercostal cartilages, through skin and muscular tissues, in a direction obliquely from above downward and outward. The parietal peritoneum at this point is punctured by a pair of curved dressing forceps, or incised; this is enlarged by spreading the forceps. The thumb and index finger of the left hand are introduced into the first-made abdominal wound, and the stomach sought for at a point corresponding as nearly as possible to the fundus. This is grasped by the dressing forceps and drawn through the 8th intercostal space, until the stomach wall overlies the surrounding integument for the space of 1 cm. After covering the wound made first with antiseptic gauze, the stomach, in case the opening is to be made at a subsequent sitting, is sutured by means of its serous covering only to the edges of the wound. In case it is to be opened at once, the serous, muscular and mucous coats are together attached to the opening in the intercostal space. The abdominal wound is then sutured. After numerous trials upon the cadaver, Hahn found that there was no danger of wounding the diaphragm if care was taken to always select the space between the cartilages of the 8th and 9th ribs, inasmuch as the former

has its attachment to the cartilages of the 7th rib, toward the median line, acting in such a manner as to leave the 8th intercostal space uncovered and free for operation.

The advantages claimed for the operation are as follows:

1. A small and contracted stomach can, with greater ease, be drawn forward and attached at this point.
2. The attachment seems to be more reliable than when made to the edges of the abdominal wound. The contents of the stomach, on account of the better closure of the opening, do not come into contact with the wound to the same extent as in the older methods.
3. The feeding of the patient can be better accomplished; the closure of the space by the approximation of the ribs acts as a pinch-cock, thus preventing fluids from finding their way out alongside of the feeding tube.
4. No obturator or other means of closing the opening, later on, is necessary. A gradual dilatation of the fistula, owing to the resistance offered by the cartilages of the ribs, cannot occur.—*Centbl. f. Chirg.*, No. 11, 1890.

G. R. FOWLER (Brooklyn).

NERVOUS AND VASCULAR SYSTEMS.

I. Case of Wound of Femoral Vein Beneath Poupart's Ligament; Double Ligature of Vein Only; Recovery With Useful Limb. By Dr. R. P. Cox (Philadelphia). A male, æt. 22 years, sustained a penetrating wound of the groin by the forcible thrust of a sharp piece of wood. Primary bleeding but slight. After entering hospital wound was enlarged and explored by Dr. W. W. Keen. The disturbance of the clot that filled the wound provoked a copious hæmorrhage. Further search showed the femoral vein to have been pierced through both its anterior and posterior walls, just at the level of Poupart's ligament. A ligature was applied both above and below the wounds and the vein severed between them. A number of small vessels also were severed by ligatures. Limb elevated and wrapped in cotton wool. Marked cyanosis followed immediately upon the operation, and considerable subsequent œdema. At the end of

48 hours the cyanosis had nearly disappeared, with slight lessening of œdema. Nine days later the œdema was greatly diminished, and the limb was lowered to the horizontal. Patient discharged at end of six weeks, with some stiffness of limb, and tendency to swell upon prolonged standing or walking. Seven months later all œdema and stiffness had disappeared, and no inconvenience whatever remained as a result of the injury.—*Weekly Medical Review*, June 21, 1890.

II. Suppurating Lymphadenitis of the Groin, Simulating Inguinal Hernia. By F. SALTZMANN. A workman, æt. 42 years, presented a small tumor of the right groin, which, as it was gradually increasing in size, and accompanied by disturbances of digestion, pointed to an inguinal hernia, and an operation seemed indicated. For four years the patient had observed in the right inguinal region growth, gradually increasing in size; this could easily be pressed in. Every attempt at reposition was in vain; toward the last it became painful, and during the last four days there was obstipation but no vomiting. The operation revealed a hernia-like cavity, filled with a large mass of detritus. The spermatic cord lay to the outer side of the sac, which thickened walls were continued up through the inguinal canal to the upper and posterior portion of the pelvis, where it was in communication with a large retro-peritoneally situated cavity, which, also, was filled with the same substance as the cavity in the inguinal canal. Microscopic examination of the wall of this cavity showed it to be made up of alveolar tissue, completely resembling lymphatic gland tissue. An increase in size of the spleen could also be diagnosed.—*Finska lakarsällsk. handling*, Bd. 30, p. 374.

F. H. PRITCHARD (Boston).

HEAD AND NECK.

I. Aphasia Due to Cerebral Abscess Cured by Trepanation. By Drs. A. SANGER and C. LICK (Hamburg). This case is interesting from the fact that there was a sensory acoustic aphasia present. So far there are only two cured cases of cerebral abscess in which aphasic disturbances were noticed; they are those of Horsley and

Schede. The present case, a man, æt. 52 years, merchant, entered the hospital on August 2, 1889, and presented the appearance of a person suffering from some psychical trouble. He could give no distinct history, muttered a few words, but by his signs showed that he was suffering from severe pain in the region of the left ear. This ear was much swollen, and the external auditory canal was almost closed, except for a small slit, through which a little thin, purulent, and foul-smelling secretion escaped.

On admission there was no fever; the pulse was slow, regular and strong. The abdomen was sunken in and there was constipation. With the exception of a certain amount of unconsciousness there was no other noticeable disturbance, especially none of the nervous system. The patient remained four days in the hospital without the symptoms increasing; on the contrary, there was some improvement, inasmuch as the swelling of the left ear diminished so much that the drum could be seen; it was bluish, and somewhat prominent. There was still some secretion, and a deep seated œdema in front of the ear. The patient was feverless, but the pulse varied between 48 and 56; constipation was marked. The unconsciousness was less, but the general appearance much worse; in fact, everything pointed to a focal disease in the brain. The patient was quiet and silent, but when excited he spoke a great deal and very rapidly, using the wrong words, and often these were incomprehensible, and sounded as if uttered in a foreign tongue; he also gave the impression of being deaf; on the right side he heard the watch at $\frac{1}{2}$ meter distance, and on the left only on contact. He could not apply the right names to objects; instead, he gave a roundabout description.

Examination of the eyes, on August 6, showed choked discs. On the same day a right-sided facial paralysis set in.

The history obtained from his wife was as follows: For the past four years he had had a discharge from the left ear and heard badly on that side. For the past two weeks he had complained of pain in the left ear, headache and loss of appetite. Had always been healthy and was not a drinker. The diagnosis was made of cerebral abscess on left side, due to otitis media and caries of temporal bone.

August 8, 1889, Dr. Lick operated; he made a curved incision over left ear, the base of the flap being downward. Skin, temporal muscle and periosteum loosened from mastoid process to base of zygomatic process. The bone was trephined by means of a chisel, and found to be of normal thickness; a piece 5x6 cms. removed.

The dura was tense and did not pulsate. At the base of the mastoid process the diploe was found infiltrated with pus, and as much of the bone removed as was found infiltrated. The tip of the mastoid was normal. On the petrous portion of the temporal bone, just above the tympanum, was a rough spot covered with thick pus. This spot was scraped with a sharp spoon. The tense dura was incised at a point corresponding to the first temporal convolution. The pia mater was intact; the convolutions were flattened. Puncture of the first temporal convolution at its posterior third gave pus. An incision was then made and about a tablespoonful of thick matter escaped. A drainage tube was put in the cavity of the abscess, and the holes in the petrous and mastoid portion of the temporal bone were packed with iodoform gauze, and the wound partially closed by sutures.

August 9. Next day no change in condition of patient; he describes a fork as "that with which one eats;" a glass of milk as "to drink."

August 10. General condition better; calls a watch a watch, and a knife "one can cut off."

August 11. No vomiting since operation; no fever; pulse 72. Patient looks better, and the aphasic disturbances are beginning to disappear. Dressing changed.

August 12. Wound looks very well.

August 15. Choked discs have disappeared. A small hernia cerebri exists.

August 27. The hernia cerebri is less; no secretion; no fever; has been out of bed a few days; has still difficulty in remembering name of objects.

September 14. Hernia cerebri on level with wound; patient can add figures, but can not multiply or divide.

September 18. Wound freshened and closed by sutures.

October 3. At place where the bone was removed the brain is seen to pulsate, and a leather cap is applied so as to protect the part. General condition good, understands well, but still has some trouble in naming objects. Perfectly deaf in left ear. Discharged cured.

December 15. Patient seen again; feels perfectly well and attends to business; complains that his memory is not as good as before he was taken sick, and that figuring is still difficult. He answers the most complicated questions quickly and perfectly; no more aphasia observed.—*Deutsche Med. Woch*, No. 10, 1890.

F. C. HUSON (New York).

II. Sarcoma of the Sheath of the Optic Nerve. By F. SALTZMANN. A tumor, the size of a fist, projected from left orbit, covered by the greatly distended eyelids and completely including the globe of the eye, with the exception of the partially degenerated cornea. The tumor was extirpated, and on microscopic examination it was found to consist of a small celled sarcoma, originating from the outer sheath of the optic nerve. The tumor had made its appearance at the inner canthus, after a trauma of the globe some twenty years before, and gradually extended from there. Ophthalmoscopic examination of the diseased eye showed only a red reflection from the fundus.—*Finska lakaresallsk. handl*, Bd. 30, p. 490.

III. Two Cases of Hæmatoma Auris. By Dr. E. SCHMIEGELOW (Copenhagen). In the "Third Report of the Clinic for Ear, Nose and Throat Disease" in the "Kommune Hospital" of Copenhagen, the writer mentions two cases of hæmatoma auris.

CASE I. Vilhelm L., æt. 15 years (Dec. 21, 1887), has noticed for two days a swelling of the concha; cause unknown. The swelling increased in size with a feeling of tenseness. The general condition uninfluenced. On the concha, anteriorly and posteriorly, a swelling, the size of a hazelnut, is noticed, covered by skin, somewhat injected, not sensitive, and tensely fluctuating. On incision a quantity of dark blood and coagula were evacuated. Tamponade with iodoform gauze and a compression bandage.

January 3, 1888. Some thickening of the cartilage, otherwise the ear has its usual form; the wound healed; discharged.

CASE II. Niels P., æt. 34 years (March 9, 1888). Fourteen days ago the patient received an injury of the right ear while carrying a pig's carcass upon his shoulder. The blow was slight. The next day a small swelling appeared on the surface of the concha, which gradually increased in size. Objectively the ear was greatly increased in size by a tensely elastic tumor which included the entire ear and masking its outline. Great sensitiveness to pressure. The length of the swelling from above downwards was 6 cm., its breadth $3\frac{1}{2}$ cm., and thickness scarcely 3 cm. Incision evacuated a quantity of dark and uncoagulated blood mixed with coagula. The patient was then sent to the hospital.

In the first case the condition in question was that of a spontaneous othæmatoma in an apparently healthy individual, which exclusive appearance among the insane has long since been proved. In the other case, on the contrary, the tumor was traumatic, although it appearing on the day after the injury. Clinically, it is of interest to note that one could not say, in the first case, until an incision had been made, whether one had to deal with an othæmatoma or a serous cyst (cf the second case of "The Second Report of the Clinic," etc.—*Hospitals-Tidende*, 1887, p. 516, where two cases of serous cysts were reported).

In the first case the incision healed, leaving a disfiguration of the auricle; the further fate of the second cyst is unknown, as he was lost sight of.—*Hospitals Tidende*, No. 28, 1889.

ALBERT PICK (Boston).

IV. Case of Sabre-Wound of the Skull and Brain. By DR. IVAN I. OSTROUMOFF (Arkhangelsk, Russia). The author narrates a noteworthy case of an adult male prisoner who, during a riot in the town prison, received two severe injuries inflicted with a cavalry sword, one of them being an extensive flap wound involving the left cheek, lower moiety of the left auricle, and corresponding side of the neck; the other a penetrating wound of the skull, measuring over 11 centi-

metres and occupying the left frontal region. It was situated slightly to the left from the frontal tubes, commencing a finger's breadth above the eyebrow and opening sagittally to end in the hairy area of the scalp. After removal of the blood-clots filling up the very widely gaping defect, a considerable portion of the cerebral hemisphere bulged out, exposing the presence of a deep cut wound of the brain with everted edges. The hernia was at once reduced with the fingers (under a jet of a 3% carbolic acid solution), the parts freely powdered with iodoform, and the cutaneous wound closed with silk sutures (without any drainage). In the same way the buccal and cervical lesions were treated, after which the wounds were dressed with iodoform gauze and hygroscopic cotton-wool. The aftercourse scarcely left anything to be desired; all the cuts (including that of the auricle) speedily healed *per primam* under 4 dressings without any fever, the sutures being removed on the 6th and 9th day; on the 10th day the patient got up. For several months, on palpation of the right edge of the cranial defect, there could be felt "a peculiar crackling sound resembling that of a tree swinging to and fro from wind" and depending, probably, upon the presence of some fissures in the bone. Later on, the phenomenon totally disappeared. On examination about a twelvemonth after the accident, the cranial defect was found to have considerably decreased. No morbid symptoms whatever, beyond some temporary initial anæmia, were observed at any stage of the case.—*Proceedings of the Arkhangelsk Medical Society for 1889*, vol. ii, 1890

V. Fatal Hæmorrhage from the Internal Carotid in Cancer. By DR. ARKADY P. LEVITZKY (Moscow, Russia). An anæmic and emaciated woman, æt. 47 years, was admitted to Professor N. V. Sklifosovsky's clinic on account of an extensive malignant disease of the right cheek and corresponding halves of the lower jaw and tongue, with enlargement of the submaxillary lymphatic glands. Prof. Sklifosovsky excised the affected parts, including the glands, which proved to be firmly adherent to the external carotid; hence, the latter was tied and divided. The wound was closed with sutures and supplied with drainage. The healing process went on more or less satisfactorily until

the 61st day, when, during an attack of cough, hæmorrhage from the mouth suddenly appeared. It was controlled, but soon recurred in a still more alarming degree, and, in spite of all measures, terminated fatally on the next day. On the post-mortem examination the internal carotid was found perforated, the rent admitting a fine probe. The common carotid at the site of its bifurcation was surrounded with a dense cancerous wall. A microscopical examination showed that in the vicinity of the perforation the muscular coat of the vessel had totally disappeared, its place being occupied by a fine round-cellular infiltration. No characteristic cancerous elements could be detected in the vascular wall. According to the author's theory, the vessel was affected with an inflammatory process caused by the immigration of the round cells, these "vanguards of cancer."—*Letopis Khirurgitcheskaho Obshtchestva V' Moskve*, No. 2, 1890, p. 89.

VI. Massage in Parotitis and Mastitis. By DR. VLADIMIR I. ZEMBLINOFF (Usman, Russia). The author emphatically recommends an early local massage as an excellent means for cutting short parotitis and mastitis and preventing the formation of abscesses. In the case of parotitis, the patient should be directed to open his mouth as widely as practicable, after which the operator pushes the cheek aside by means of a spatula until the orifice of the stensonian duct has fully come to view, and with his other hand commences to make at first gentle, subsequently ever firmer, strokings along the duct from the gland toward the orifice, gradually increasing the range of the manipulations and ultimately kneading the parotis itself.

In mastitis; the author grasps the affected mamma with his left hand, and with his right fingers makes in the beginning light kneading of the nipple and subsequently gentle "milking" manipulations. On the appearance of milk and pus, he proceeds to make strokings along the whole course of the glandular ducts from their beginning towards the nipple, and ultimately passes to more or less energetic kneadings of the diseased lobule itself, pressing out its contents towards its duct (which "may be usually fairly distinctly made out in the shape of a tender cord"). The sittings should be made more or less prolonged

nd, if necessary, repeated daily. The manipulations—especially the first ones—are rather painful, but they may be made painless by a local application of a cocaine solution. The patients, however, readily give consent to repetition of the seances, since glandular pain and tension are strikingly relieved by the manipulations from the very beginning. The quantity of inflammatory products pressed out from an affected parotid or mamma in such way is said to be often enormous. The author adduces 5 cases of parotitis and 8 of mastitis, treated after the method. In all recent cases a rapid and complete resolution ensued (and that sometimes after a single seance). In some more or less neglected cases, all acute symptoms speedily subsided and the inflammatory process markedly decreased, but still an incision became ultimately necessary to complete a cure.—*Vratch*, Nos. 3 and 7, 1890, pp. 60 and 64.

VALERIUS IDELSON (Berne).

VII. Socin's Zinc-Paste Dressing after the Operation for Hare-Lip. By Dr. W. VON NOORDEN (Tubingen). Neither of the various salve-plaster and collodion dressings has proven satisfactory for this purpose, especially as regards antiseptis. In the report of the Basle hospital for 1883, Socin recommended a zinc-paste dressing as far superior to all others in antiseptic and mechanical effect as well as in simplicity and convenience. This paste is made of 50 parts zinc oxide, 50 parts water, and 5 to 6 parts zinc chloride. It has the quality of very rapidly drying to a firm crust in the air. The paste should be freshly prepared, and then forms an air-tight, firmly adherent covering. After completion of the operation the suture-line and vicinity is again disinfected and carefully dried. Then the paste is laid on with brush or spatula over the whole extent of the upper lip, interspersed with one or more extremely thin layers of cotton for support. If the wound extends into the nostril, the paste should also extend into the nasal opening, but without blocking it. The nasal secretions run over the paste without softening it. Thus the wound is protected from foreign matters. The paste is not in the slightest degree irritating, never any eczema. In 4 to 6 days the dressing is

changed for removal of sutures. With some care it can be slowly clipped off without injury to the wound, or may have already loosened itself. A fresh paste dressing is applied and allowed to remain until it crumbles up. In 10 cases within a year a primary union was secured, without any notable suppuration about the stitches or other disadvantage. Further, he uses the same plan in small sutured wounds about the face and head, and repeatedly also after herniotomies, extirpation of labial cancer and goitre, and even laparotomy, both with and without drainage.—*Bruns' Beitrage z. klin. Chirurg*, 1889, Bd. iv., Heft 2.

VIII. On the Treatment of Granulation-Stenosis of the Trachea following Tracheotomy. By DR. T. KOSTLIN (Tubingen). Voltolini's sponge-method of removal per os after permanently removing the tracheal cannula is here advocated. This plan was first applied by Bruns after successful trial of it in multiple papilloma of the larynx in children. In both forms there is a great tendency to recurrence. Its great advantage is its applicability in all cases and the fact that it permits the immediate withdrawal of the cannula. These granulation-stenoses are caused by connective-tissue neoplasms of various forms and sizes, that grow into the lumen of the trachea and so form an impediment to the air-current. They are most frequently situated at the upper inner angle of the tracheal wound. They may develop very early, even by the fifth day after the operation. As a rule, the respiratory disturbances appear immediately on attempting to remove the tube, or the e may develop gradually with the closure of the fistula. Sudden death from suffocation may occur. In other cases the dangerous symptoms begin long after removal of the cannula and closure of the fistula; suffocative attacks increase, especially during sleep, and the child succumbs unless suitably relieved.

Two questions arise, one as to the cause of the granulations, the other as to treatment, prophylactic and curative. His case bearing on this was that of a girl, æt. 5 years, with diphtheria. Tracheotomy, Dec. 26, 1886, through the upper two tracheal rings. Trouble in breathing appeared on removal of the tube, so this was not finally re-

moved until Jan. 14. For a few days all went well, when nocturnal suffocative symptoms developed. Laryngological examination Jan. 29 showed a pale reddish growth on the anterior wall and more than half filling the tracheal lumen. Reopening of trachea that night. Removal of the granulations next day with sponge. Relapse. As this did not improve, a month later "the granulations were removed with Voltolini's laryngeal sponge. A small sponge was fastened to the front end of a strong laryngeal sound. Then under guidance of the left index the sound was pushed through the glottis with slight pressure and passed far down the trachea. Here it was moved energetically up and down a few times, so that the tracheal wound was wiped by the sponge and thus the granulations torn off. The child was under slight narcosis meanwhile. The cannula that had been removed for the application was immediately re-introduced. Laryngological examination the next day showed the trachea quite free from granulations." Three subsequent relapses were treated in the same way. By July 16 it was possible to let the wound heal up, but there was another relapse towards the middle of August. This was sponged out without narcosis, and the child remained well.

As to the cause of these granulations he cites various theories and numerous cases to show that no one theory has general application. It is commonly recognized that these growths are nothing else than proud flesh, and it follows that like this they are more apt to occur in wounds subject to irritation, especially by foreign bodies. On this line he finds their most satisfactory interpretation. Prophylaxis demands avoidance of cricotomy, of a too long incision, of too long retention of the cannula and of the speaking Cannula.

Bocker (1887) cured 3 cases by intra laryngeal use of a fenestrated catheter, but in another case could not sufficiently control the child. This method is largely a matter of luck unless guided by the laryngoscope. The sponge-method does away with this and is also advantageous to avoid long retention of the tube from fear of the frequent relapses. — *Bruns' Beiträge z. klin. Chirg.*, 1889, Bd. iv., Heft 2.

WILLIAM BROWNING (Brooklyn).

IX. Cases of Erysipelas of the Pharynx. By K. G. SEN-
NANDER (Upsala). The writer (in a small pamphlet) describes firstly
two cases observed by him in the surgical clinic of Upsala, the clinical
course of which rendered the diagnosis beyond a doubt. Two stu-
dents of medicine who were serving in the clinic, fell sick, one soon af-
ter the other; they had been in the surgical as well as in the inner
clinic, where several cases of erysipelas had been under treatment.
The disease commenced with rigors and intense reddening of the mu-
cous membrane of the pharynx, with sore throat and difficulty in swal-
lowing. There were disturbance of the general condition, continuous
high and remitting fever, swelling of the glands at the angle of the
lower jaw, and then violent pain in the ear with following perforation
of the tympanic membrane, when some bloody pus was evacuated.
This perforation was followed by an erythema of the integuments of
the external meatus; from there a characteristic erysipelas passed over
onto the corresponding part of the face, where the vesicles developed
on the forehead up to the boundary formed by the hair. The aural
disturbances, as roaring in the ears, difficulty in hearing, and perfora-
tion of the membrane, disappeared under the proper treatment

In addition to these two observations the writer communicates sev-
eral cases of pharyngeal erysipelas which were treated at the same
time in the inner clinic of Prof. Henschen. In one case the extension
of the disease over the neck rendered tracheotomy necessary; another
one, complicated with pleuritis and peritonitis, ended fatally, while in
a third case an otitis media developed.

**X. On Tracheotomy Complicated with Calcification of
the Trachea.** By Dr. NICAISE. The rings of the trachea present,
with advancing age, troubles of nutrition, and especially calcous de-
generation which, however, is not ossification. This calcification may
be induced by the presence of laryngeal cancer, or by chronic affections,
especially inflammations of that organ and the trachea. Calcification
of the trachea constitutes a slight complication in tracheotomy. If
one does not succeed, and the bistoury slips, then one may excise the
trachea transversely. When one finds such a case then the bistoury

point should be introduced between two rings, the rings coming together during calm respiration. Then the point of a pair of scissors may be introduced and the trachea slit up longitudinally. The canula should not be very large, but of the caliber of the trachea when the rings are in contact. Two cases were reported which were operated on thus — *Revue de Laryngologie d'Otologie et de Rhinologie*, April, 1890.

XI. On the Comparative Value of Tracheotomy and Inter-Crico-Thyroidian Laryngotomy. By Dr. J. CHARAZAC (Toulouse). The writer concludes as follows:

1. In all acute affections of the larynx, when a consecutive stenosis is not to be feared, one may perform laryngotomy.

2. In contractions of the larynx dilatation is easier after tracheotomy.

3. In primitive extrinsic cancer of the larynx it is more prudent to perform tracheotomy; laryngotomy may be done in extrinsic, and especially in secondary, cancer.

4. In tuberculosis one may, according to the case and extent of the laryngeal lesion, perform the one or the other of the two operations. — *Revue de Laryngologie d'Otologie et Rhinologie*, April 1 and 15, 1890.

XII. Carcinoma of the Larynx. By Dr. E. SCHMEIGELOW (Copenhagen). The patient, a male, æt. 49 years, had suffered from attacks of acute laryngitis and hoarseness in a varying degree for about two years. In November, 1887, a physician attempted to remove a pharyngeal polypus. This was followed by a stenotic attack which necessitated tracheotomy. A polyp of the size of a bean arising by a broad base from the left vocal cord's uppermost surface was noticed; the cord was completely immovable. On Nov. 23 laryngo fissure was performed, when the tumor was found to extend down below the free surface of the vocal cord. The tumor was removed. Microscopic examination revealed it to be a fibro-adenoma. The tumor recurred

very soon and the patient died of marasmus and carcinoma of the larynx in 1888.—*Hospitals Tidende*, No. 33, 1889.

XIII. Three Cases of Ligature of the Thyroid Artery, according to Drobnik, in Goitre. By DR. MATLAKOWSKI.

1. A girl, æt. 20 years, who had suffered some four years. She had dyspnœa on exertion; circumference of the neck, 4 cm. Ligature of all the four arteries was performed. The wound healed, undisturbed by any event, after 18 days. The circumference of the neck had decreased 2 cm.; the dyspnœa seemed to be somewhat less. A year after the operation the patient was well; the circumference of the neck at this time was unknown, however.

2. A girl, æt. 17 years; for 3 months the thyroid gland had rapidly increased in size, accompanied by difficulty in breathing. The circumference of the neck was 30 cm. Operation as in the first case. The wound healed after 10 days; the further history of the case is unknown.

3. A girl, æt. 20 years; for 2 years growth of the thyroid gland, in spite of injections of iodine. Some dyspnœa when lying upon the back. Circumference of the neck, 38 cm. The goitre pulsated strongly. Ligature as in the first case; the wound healed in 10 days. No change in the gland was noticeable.

The writer comes to the conclusion that Drobnik's method is more easily performed and serves better the purpose than all others, and that the fear of necrosis of the gland after unilateral ligation of the carotid is unjustified.—*Gaz. lekarska*, 1889, No. 18.

F. H. PRITCHARD (Boston).

ABDOMEN.

I. Pneumo-Peritonitis. By DR. STUDSGOARD (Copenhagen). On Dec. 8, 1888, Sterdsgoard performed a total hysterectomy on account of long lasting prolapse of the uterus; the procedure was the operation of Richelot. The forceps were removed thirty-six hours after the operation; the tamponade was made with iodoform gauze up to December 11, when it was discontinued. In order to cleanse the

vagina the woman was placed sometimes in the dorsal and sometimes in the lateral position. All went along well until December 24, when symptoms of incarceration of a small crural hernia, the presence of which was remarked before the operation, made their appearance and the presence of free air in the abdominal cavity was made out. The diagnosis of pneumo-peritonitis was made and the hernial sac opened, when a large quantity of odorless air escaped from the abdominal cavity. January 6, all the air had been absorbed and percussion gave a normal sound; January 12, the woman entirely cured, left the hospital.—*Hospitals-Tideude*, 1889, No. 22.

F. H. PRITCHARD (Boston).

II. Operation for Ventral Hernia of Subperitoneal Fat.

By JOHNSON SMITH (Greenwich, England). A healthy seaman, æt. 42 years, had been troubled for seven years with a small soft swelling below the sternum and complained of pain at that point, especially after walking; pains also radiated over the front of the chest. He suffered greatly from dyspepsia, occasionally vomiting after a full meal. The tumor lay in the middle line of the anterior abdominal wall just two inches above the umbilicus and was soft and compressible, irregularly shaped and two inches and a quarter in diameter, stretching a little more to the right than to the left. There was weakness of the abdominal wall for some distance about this swelling. Pressure of a bandage or plaster on the tumor caused much uneasiness. Under chloroform, a vertical incision, three inches long was made over the tumor, at once exposing a circumscribed mass of lobulated fat; which resembled omentum but was not covered by a sac or any membranous investment at all resembling peritoneum. This mass of fat was continuous by means of a small pedicle with subperitoneal fat, the pedicle passing through a small orifice of the size of a No. 12 catheter. After a silk ligature had been applied to the pedicle, the opening in the linea alba was enlarged and the little finger passed through, moving in all directions freely between the muscles of the abdominal wall and the peritoneum. The pedicle having been returned into this space, the edges of the enlarged opening in the linea alba were stitched together, and

the wound dressed antiseptically. Complete healing ensued, the patient being discharged cured four weeks later.—*London Lancet*, May 10, 1890.

III. Case of Spontaneous Rupture Externally of the Sac of an Umbilical Hernia. By HENRY PILKINGTON, M.R.C.S. (Ormskirk, England). A farmer's widow, æt. years, who had always enjoyed good health was suddenly taken ill. On the arrival of Dr. Pilkington, she was found lying on her right side in great pain. She had just ceased vomiting and presented marked symptoms of collapse. On examination of the abdomen, an immense tumor was found, two feet and two and a half inches in circumference, formed by an umbilical hernia, with irregular pouches in three places, each pouch as large as a hen's egg. The mass was resonant on percussion everywhere and the skin over it very tense and extremely thin. At the umbilicus itself protruded through a rent in the skin, a large knuckle of intestine, very distended and more than eight inches long on the convex border. The rent was so small that the bowel was quite strangulated, and presented a purple or almost black color, consequent on its four hours of strangulation. Without other professional assistance, the operator enlarged the constricting wound sufficiently to permit the return of the gut. The skin was so very thin that it was not proper to use the ordinary interrupted suture and a quill suture was substituted for it. Suitable quills not being attainable, substitutes for them were made out of white pine wood, each piece four inches in length and as thick as an ordinary lead pencil. The peritoneum having been carefully adjusted, the stitches were inserted not quite a half an inch from the wound five being required to close it. Iodoform was sprinkled freely about the wound and the large hernia supported upon a pillow. The patient rallied well and no peritonitis followed the accident or operation. The wound healed slowly but satisfactorily and three weeks later, only a small and rapidly healing sore was left. It is worthy of note that the hernia had existed for seventeen years without any other person being aware of its presence; and that in spite of four hours exposure of the intestine to the cold of a midwinter day and the friction of the patient's clothes, no peritonitis resulted.—*Lancet*, May 10, 1890.

IV. Abdominal Section for Acute Intestinal Obstruction.

By JORDAN LLOYD, F.R.C.S. (Birmingham, Eng.) The author details eight cases and suggests in conclusion: (1) In acute intestinal obstruction our attention should be primarily directed to the strangulation of the walls of the bowel rather than to the stoppage of the fæcal current. When strangulation exists immediate operation is demanded. (2) The ordinary text-book distinctions between obstruction in the large and small bowel are not always to be depended upon. (3) In all obstructions above the rectum calling for operation median abdominal incision is the proper primary procedure. (4) When the abdomen is opened the examination of its contents should be systematic and expeditious, the hand being introduced into the peritoneal cavity, if necessary, and if the obstruction is not quickly discovered, the most distended coil should be fixed to the skin and opened at oncé. If the large intestine is the part involved, the cæcum or sigmoid should be brought through a special opening made in either groin. (5) With proper precaution a few feet of bowel may be withdrawn from the peritoneal cavity; and returned without difficulty and without serious risk. (6) Rapidity of procedure with a minimum of disturbance are the essentials of operative success. (7) The number of lives saved by abdominal section will increase as earlier and more accurate diagnosis comes to be made.—*London Lancet*, April 19. 1890.

JAMES E. PILCHER (U. S. Army).

V. Five Cases of Gunshot Wound of the Abdominal Viscera Treated by Abdominal Section. Two Recoveries.

By Dr. A. C. BERNAYS (St. Louis). Case I. Female, æt. 9 years. Pistol charge of three turkey shot, caliber 18; wound of entrance three inches below umbilicus. and three and one-half inches to the right of the median line. Laparotomy one hour after the accident through site of wound; three perforations found in the beginning of the ascending colon; two of the shot were arrested in a hard mass of fæcal matter in the colon, the third perforated the posterior wall and lodged in the mesocolon, causing a hæmatoma between the layers of the mesocolon. Some fæcal particles had escaped through the holes in the anterior

wall of the colon. The holes were closed by Lembert sutures. Peritoneum cleaned and the external wound closed. Death from peritonitis on the sixth day.

Case II. Male, æt. 12 years. Pistol shot, caliber 22. Bullet entered back, two and one-half inches to the left of the spinous process of the second lumbar vertebra. Laparotomy fifteen hours after the accident. Incision from umbilicus to pubis; eventration of small intestines; one and one-half pints of blood removed from cavity of pelvis, which came from a wounded lumbar vein; six perforations in the ilium were found; two of these were already so firmly plugged with plastic lymph as to need no treatment; the four remaining were sutured. A shred of cloth and the bullet were found in the omentum. Recovery complicated by two attacks of obstruction of the bowels, which were overcome by copious enemata and massage, under narcosis. Ultimate complete recovery.

Case III. Male, æt. 38 years; 41 caliber pistol. Wound of entrance two and one half inches above the umbilicus, about two inches to the left of the median line. Laparotomy four hours after accident. Incision from sternum to one and a half inches below umbilicus. A ragged hole in the anterior wall of the stomach came into view, in which was hanging a piece of the waistband of the patient's drawers. Some of the contents of the stomach, with fluid, had escaped. Hole closed by suture. No perforation of the posterior wall of the stomach, ball having passed through the pylorus and made an exit through the duodenum two inches below pylorus; this wound also sutured. Eighteen inches further along the gut a third large, irregular, ragged perforation was found, which was also sutured. No other holes found. Abdomen closed. Subsequent uneventful history. Complete recovery.

Case IV. Male, æt. 25 years; 32 caliber revolver. Wound of entrance two inches below and about one inch to the left of the umbilicus. The ball ranging upward passed through the diaphragm, entered the thorax, and finally lodged under the cuticle in the seventh intercostal space in the axillary line. Laparotomy three hours after accident. Incision from wound of entrance to umbilicus and thence upward to

sternum. Wound of right gastro-epiploic artery detected and ligated. Anterior wall of stomach perforated in three places; some of the escaped contents of the stomach found free in the peritoneal cavity. Perforations sutured. A wound of the liver was identified; it was plugged with a large clot and was not interfered with. Considerable blood was removed from beneath the liver. Abdomen closed with two large drainage tubes in position. Nourished by rectal enemata for first week. Drains removed on fourth day. Troublesome cough for a time beginning on the fifth day, causing gaping of superficial portion of operation wound. Steady improvement and ultimate complete recovery,

Case V. Male, æt. 22 years; 32 caliber revolver. Wound of entrance two inches above umbilicus, and one inch to the right of the median line. Laparotomy seventeen hours after accident. Incision in median line from umbilicus to sternum. Perforations in both walls of the stomach found and sutured. The head of the pancreas was grazed by the ball which was then lost in the post-peritoneal tissues. An enormous blood extravasation infiltrated the tissues behind the peritoneum of the posterior abdominal wall. No interference with this attempted. Peritoneal cavity flushed with warm water. Wound closed. Peritonitis. Death at end of thirty-six hours. Autopsy revealed a perforation of the duodenum which had been overlooked. The right renal vein had been lacerated and had been the source of the post-peritoneal hæmorrhage.—*St. Louis Medical and Surgical Journal*, June, 1890.

REVIEWS OF BOOKS

A NEW THEORY OF CHLOROFORM SYNCOPE. By ROBERT KIRK, M.D., 12mo. pp. 58. Glasgow, John Tomlinson, 1890. J. H. Chambers, St. Louis, Mo.

One begins to read this little book with high hopes of getting some practical suggestions on a subject of the greatest importance. For the author tells us that the administration of chloroform can be made five times as safe as that of ether. And he seems to indicate that a person under the proper influence of chloroform is somewhat less liable to death than one in good health at his business. He says that it is necessary to give plenty of chloroform in order to make it absolutely safe. And he adds to this, that the danger does not consist in keeping up the administration of chloroform, but from stopping it. In any case then it is important for the administrator to keep right on giving the chloroform, and then the patient will be perfectly safe. But if the chloroform vapor is at any moment withheld, death may follow in about one minute, and it then amounts to this: A patient is all right while he is going under the influence of chloroform; but if you stop the inhalation of the vapor for any reason, he may die. Easy is the way to Avernus—but to get out again is just what we have all thought to be difficult all along; and really, if the theory of this book be true, death from chloroform ought to happen at the end, instead of at the beginning, of anæsthesia. There comes a wound or a broken bone and then a “whiff” of chloroform, and ere the man sleeps, his life is over and he is dead.

Ah! obdurate ignorance of the relations of the internal and external forces of the pulmonary membrane, why did you not give another dose and keep the man alive? For you should know that “the effect will be in precise proportion to the intensity with which the force was acting, and to the suddenness with which it is withdrawn! And so we may add, if this precept be true, let the surgeon give most explicit and imperative directions for the administrator to restore his patient to consciousness in the most gradual manner, for it must be a grave and

fatal error to stop the inhalation of chloroform vapor suddenly at the close of an operation. The conditions must be the same at the close of an operation as at the beginning, in so far as the toxic effects of the vapor of chloroform are concerned, on the basis of the theory enunciated in this book. The author says: "all the various degrees of syncope" * * * "are produced, not by the absorption of chloroform, but by the elimination of the vapor from the lungs at an early stage, and a reversal of the process that ought to have gone on! That is, the chloroform vapor ought to have been continued, and then there would have been no reaction and no danger. For safety consists in giving plenty of chloroform, if anybody knows what that is in any given case.

After the accumulated experience of years has been so completely swept away by the pen of the new theory, one may indeed hesitate to record his observations touching so grave a subject as anæsthesia. Yet we may be rash enough to give some of our impressions such as they are: In the earlier years of my professional work, I used only chloroform for anæsthesia. And in my college clinics I continued its use a number of years. And while I never had a fatal case, it quite often happened that I was obliged to stop in the midst of an operation, and make artificial respiration, in order to bring my patient out of what appeared to be fatal syncope. This happened quite often, and the syncope as a rule did not occur at the beginning of anæsthesia, but at some time later during the operation, and more frequently in a case that required a serious operation, and sometimes the final steps of the operation had to be finished with great haste, and at times I have taken away the chloroform altogether, and then completed the operation. It was my practice to put the patient rapidly under the influence of chloroform for the most part. In the case of a feeble patient I generally gave direction to proceed with care and caution. As time went on I appreciated more and more the dangers and perils of chloroform. The oft recurring artificial respiration in the patient who had lost his pulse and who had ceased to breathe led me to abandon chloroform and take to the use of ether as an anæsthetic. I became profoundly impressed with the fact that chloroform is a drug of immense power, and that death followed sometimes from its use, simply because it produced fatal intoxication, when given in over-dose. And it never occurred to me to suggest the propriety of giving more chloroform to remedy an over-dose already given. I would as soon give opium to bring a person out of opium sleep, as I would chloroform to prevent chloroform-syncope. The simple fact is that chloroform

kills some patients, no matter how expert the administrator. And this is a fact that has been demonstrated over and over again. And when chloroform kills it makes short work of it. It acts on the nervous system, producing insensibility, unconsciousness and maybe death. It interferes with sensation, sense and voluntary motion, and the patient wakes up again, and when it acts on the ganglionic system, to a sufficient extent, there is an end of life. To say that the sudden elimination of chloroform from the system tends to cause syncope is the same as saying that the removal of a cause will augment the effect that is produced by that cause.

One is impressed with the notion, as he reads on in this little book, that the author has been deceived into making a special plea for chloroform; that he has found that a number of deaths have followed its administration; that this ought not to be; that chloroform is perfectly safe; that no one ought to die from its use; that if death followed its use, the fault lies in the administration; that this accident must be explained as follows: That less vapor given would not cause anæsthesia, and so the conclusion by way of explanation is assumed to be that too little chloroform is given in fatal cases; and that in order to be sure of preventing a fatal accident we have only to give plenty of chloroform, that is "failure of the heart after the chloroform is withdrawn can only be certainly prevented by making the anæsthesia sufficiently deep in the first instance." The following sentences are worthy of production here they indicate what the book teaches; "The above principles point to a single plain rule for the administration of chloroform. This is to keep up a continuous atmosphere of vapor until deep anæsthesia is induced, and not to stop short of this point for any reason whatever, and no matter what the operation."

"So far from there being any danger of getting an unduly concentrated atmosphere of chloroform in our climate, the difficulty is all the other way, to get it strong enough."

"The interrupted method of administration must forever be abandoned; the administrator must recognize that there is no danger in the early stages but in going backwards, and it will soon be found that there is no more marvellous instrument of precision, certainty, and safety in the whole range of materia medica than chloroform."

These rules of practice appear to be imperative, and would be admirable, if they were true; but they prove too much. And we cannot approve of, nor can we recommend them. At the risk of seeming unappreciative and indifferent, we feel it our duty to advise surgeons not to follow them. In good faith, we believe, after much experience,

that chloroform is a potential agent, and ought to be used with great caution, as well as with much skill.

The comparative safety of chloroform and ether may not take up our time. A discussion of this point would open up a wide field of inquiry, and would occupy more space than is at our disposal.

J. S. WIGHT.

LECTURES TO PRACTITIONERS. THE DISEASES OF THE KIDNEY AMENABLE TO SURGICAL TREATMENT. By DAVID NEWMAN, M.D. 1888. 8vo, pp. 472 London: Longman, Green & Co. St. Louis: J. H. Chambers & Co.

From the preface we learn that: "In an abbreviated form the contents of this volume constituted part of a combined course of post-graduate lectures delivered in Glasgow during the summer of 1886." "Early in his professional career the author devoted considerable attention to the study of the functions of the kidney from the physiological, and of the diseases of the kidney from the histological and medical standpoints, while at a later date he approached the subject from the surgical side."

The writer quotes the above paragraph from the author's preface because it so aptly suggests the character of these lectures. They are the product of a physiologist, a pathologist and a practical surgeon, who has made the kidneys his specialty. His facilities for observation, study and practical work have been unusual. His book is a clinical study and is full of information upon the subject of which it treats. Every topic is dealt with in the same careful and complete manner. The author has made free use of the abundant material, pathological as well as clinical, at his disposal, and his descriptions of experiments and cases are so admirable and so well arranged that his conclusions are irresistible.

One of the most valuable features of the book is the statistical tables, showing the results of over 500 operations upon the kidneys. These are grouped according to the conditions for the relief of which they were undertaken and are so arranged as to show the comparative results obtained by the various procedures adopted.

Of the lectures, which are six in number, the first, 76 pages, is devoted to malpositions of the kidneys. The occasional occurrence of "floating," as distinguished from "movable," kidney is at first clearly established and the surgical importance of the anatomical distinction pointed out. The greater portion of the chapter, however, is devoted

to the consideration of movable kidney, upon which subject the author published a valuable monograph in 1883, of which this article may be considered a second edition.

After emphasizing the frequency of the condition and the fact that it is so often overlooked, there follows an exhaustive study of the etiology and symptomatology, which will repay the careful reader. The exact nature of his observations of a case characterized by recurring attacks of hydronephrosis, as well as another illustrating the symptoms when there is obstruction of the kidney circulation, due to a twisted pedicle, serve to prove that these conditions exist and will enable them to be recognized.

The importance of determining the exact condition of each kidney before proceeding to operate is well illustrated in the form of these cases in which, on catheterizing the ureter, both kidneys were found in an advanced stage of degeneration, the movable kidney being the better of the two.

In the measures of treatment, the author is a strong advocate of nephrorraphy, after milder measures have proved unsuccessful. In support of his position, he compares the statistics of 30 nephrectomies with 9 deaths and 21 nephrorraphies with 1 death, not due to the operation. In view of the admirable results and comparative safety of the latter operation, as shown by recent reports, no one will be likely to take issue with his conclusion that: "Extirpation is only permissible when nephrorraphy has failed, and the patient's life is still seriously threatened, when the movable is diseased, or the fixed kidney healthy."

The General Symptomatology of the Diseases of the Kidney Amenable to Surgical Treatment is discussed in Lecture II., pages 77-102.

Lecture III, pages 103-163, treats of Diseases Characterized by Accumulations of Non Inflammatory Fluids; Hydronephrosis Congenital and Acquired and Cystic Diseases of the Kidney.

Lecture IV, pages 165-577 deals with Diseases Characterized by Simple Inflammatory Changes with Accumulation of Inflammatory Products; Suppurative Diseases of the Kidney.

Of Lecture V, pages 274-302 are devoted to a consideration of Tuberculous Diseases, and pages 302-346 to Injuries of the Kidney and Ureter.

Pages 347-409, of Lecture VI, treat of Tumors of the Kidney, while the remaining pages, 409-457, describe the various operations on the kidney.

A "List of Cases and Specimen Illustrations of Various Morbid Conditions and Symptoms, Arranged as They Occur," precedes the Index.

Throughout the book the author's unusual success in obtaining separate specimens of urine for examination, from each kidney, attracts attention and awakens a peculiar interest in his methods. We had hoped to find that he had devised some new and easy plan of catheterizing or compressing the ureters, but in this we are disappointed. To us, the chief merit of his operation is that it has proved so successful in the hands of the inventor. We doubt if many others will undertake to introduce urethral catheters by the aid of his speculum and electric light, though his success with these appliances, introduced into the bladder as separate instruments, leads us to hope that the modern cystoscope, by simplifying the operation, may make it more easy of execution.

A recent illumination of the interior of the bladder by means of a small electric light, introduced through a supra-pubic opening, made for the purpose of reaching an enlarged middle lobe of the prostate, in which the orifices of the ureters were plainly visible, has led the writer to consider the propriety, in suitable cases, of opening the bladder for the purpose of inserting catheters into the ureters. This procedure has the additional advantage of admitting of a thorough inspection of the interior of the bladder, which would be especially advantageous in tuberculous cases.

This book will be especially welcomed by Dr. Newman's co-workers in the field of renal surgery. Indeed, it is difficult to conceive how the author of this handsome volume could have presented the results of his studies, experience and researches so as to be of greater value to the student of this attractive field of modern surgery.

JOHN B. BOGART.

DIE BLUTERKRANKHEIT IN IHREN VARIANTEN. BY WILHELM KOCH.
Deutsche Chirurgie, herausgegeben von Billroth und Luecke. Lieferung 12. Stuttgart, Ferd. Enke. 1889 New York, G. E. Stechert.

DISEASES OF THE BLOOD IN THEIR VARIOUS ASPECTS.

It is certainly striking on account of its novelty to see scorbutus, purpura simplex, peliosis rheumatica, purpura hæmorrhagica, erythema nodosum, hæmophilia, umbilical hæmorrhage, blood-sweating and the acute fatty degeneration of the new-born connectively treated of in a surgical work.

In fact of the whole of the 227 pages contained in the book scarcely 20 are devoted to hæmophilia, the one subject among all those named of chief interest to the surgeon.

Yet hæmophilia, we are told, is only one of the various forms of scurvy, and should therefore be looked upon as an infectious disease, with the same propriety as scorbutus.

The author has devoted much time and study to the elaboration of his theme. He has made various expeditions to Russia to study scorbutus, where it is endemic in each spring and summer, and although he has fully considered all the literature of the subject (giving 19 pages in fine print of references), he has endeavored to represent the subject from an original point of view, based on his own clinical observations and on the reports of 254 post-mortem examinations of Lukin-Kronstadt.

Much of the work presented in the volume is open to the criticism of being hypothetical in nature, however scientifically sustained the various hypotheses may be.

In regard to the various headings under which the subject is treated of, we may state that the author regards the passage of the blood through the walls of the intact blood-vessels as the principal symptom of scurvy; and according to whether the extravasated blood remains imprisoned in the tissues or advances to the superficies of the skin, of the respiratory or of the digestive tracts, the various subdivisions are found, and the main difference between hæmophilia and scurvy is established.

HUETER LOSSEN'S GRUNDRISS DER CHIRURGIE. Bearbeitet von Prof. Dr. HERMANN LOSSEN. II. Band. Specieller Theil. Sechste Auflage. Leipzig, F. C. W. Vogel. 1890. New York, G. Stechert.

HUETER-LOSSEN'S PRINCIPLES OF SURGERY.

The second part of this well-known surgery is now before us, dealing with regional surgery, in contra-distinction to the first part on general surgery quite recently noticed in this journal. This part comprises three large volumes, with some 350 wood-cuts, and like the first part, has been largely re written and brought up to date, although the changes are not so apparent as in the first part. Its many friends will heartily welcome this new edition.

W. W. VAN ARSDALE.

CORRIGENDA.—In the August number, on page 130, 22d line, for “future” read *further*. Page 133, 7th line, for “emptying” *employing*.

THE DRY TREATMENT FOR OPEN WOUNDS AND ULCERS.

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THE application of the germ theory to the treatment of open wounds should not stop with Listerism or antiseptis. Asepsis is what we strive for, but the methods most in use are practically but little more than antiseptis or germ poisoning.

The following experiments were undertaken for the purpose of finding a method of cure for open wounds that would operate somewhat in the same manner as the closure and healing of incised wounds by primary union, viz., without sepsis and without suppuration. I had been disappointed with germicides, because they neither prevented suppuration in an open wound, nor rapidly checked it. I therefore discarded them, and strove to imitate the natural method of healing of small superficial wounds when left alone, viz., to dry the wound and keep it dry; or, failing in this, to drain off the fluid so constantly that the same fluid would not remain in contact with the wounded surface for the development of germs in it. Having accomplished this to my complete satisfaction, I applied the same methods to suppurating wounds, and was equally well satisfied.

The method consists in applying abundant capillary drainage to every portion of the wound, even the minutest, and changing the drainage material before it becomes saturated or clogged. Thus the fluid is drained from the surface almost as fast as formed, and any germs that may be present are removed with the dressing as often as desirable. At each dressing the

surrounding soiled surfaces are cleansed, the wound tissue dried off with absorbent material, and new drainage applied.

Before formulating my experience I will record a few of the cases which served as experiments.

CASE 1. *Abdominal Oophorectomy for Abscesses of Fallopian Tube and Ovary.* Mrs. Sc, St Luke's Hospital, March, 1890. On account of hæmorrhage at the operation I tamponed the pelvis with iodoform gauze, removing the last in ten days. There was left an open wound in the cellular tissue of the abdominal walls one inch wide, one inch deep and one and a half inch long, extending to the peritoneum. The surfaces of this wound were dried off with sublimated absorbent cotton and then packed with the same. The surrounding cutaneous surface was washed with alcohol and plentifully dusted over with iodoform powder, avoiding the cotton packing. Over this was laid sublimated gauze and then more cotton. Dressings were changed every 6 hours for the first 2 days, then every 8, then every 12, then every 24 hours. Four weeks from the date of the operation she went home with the wound healed, and without having had any suppuration whatever, nor any temperature except a slight rise immediately following the operation.

CASE 2. *Removal of Suppurating Kidney by Laparotomy. Drainage through Loin by Iodoform Gauze. Removal of Gauze in 30 Hours.* Mrs. Wm. S., Woman's Hospital, April 5, 1890. A gaping wound was left in the subcutaneous cellular tissue and muscle an inch long by an inch deep and half an inch wide. This was packed with iodoform gauze three times daily for two days, then twice daily with plain absorbent cotton, later once daily. After it was almost obliterated, viz., $\frac{1}{2}$ inch long by $\frac{1}{4}$ inch wide and $\frac{1}{8}$ inch deep, I allowed the cotton packing, as an experiment, to remain for 2 and 3 days at a time. Although suppuration did not supervene, yet the wound stopped contracting until I returned to daily dressings, when it rapidly healed.

CASE 3. *Mole Removed from Temple.* April 18 (same time as hysterectomy performed). Mrs. P.A.P., æt. 41 years. Woman's Hospital. After the stitches were removed the patient infected the wound by scratching, so that a scab formed with pus under it. Thus a suppurating wound resulted an inch long and $\frac{1}{3}$ inch wide. This was wiped dry and dry absorbent cotton applied to it twice a day, and, after two days, once a day. In a few days there was a small raw surface $\frac{3}{4}$ inch long by $\frac{1}{4}$ inch wide, smooth and red without inflammation, sen-

sitiveness or suppuration. It was healed in 8 or 10 days. I do not find the date of cure recorded, but remember the case well.

CASE 4. *Bed Sore.* Mrs. P.A.P., æt. 41 years; Woman's Hospital. Abdominal hysterectomy, April 18, 1890. (See case 3)

A bed sore 2 by $2\frac{1}{2}$ inches had developed, and, when I examined it May 10, was suppurating and looking inflamed about the edges. I stopped the antiseptic oil dressings that had been used, had the skin around it washed off with alcohol, the suppurating surface (in the midst of which was a piece of black necrosed skin) dried off with plain absorbent cotton, and then packed with the plain cotton. This was done twice daily. In 2 days I tore off the necrosed tissue and had the wound dressed once a day. In 5 days, May 15, it was but little over half its former size, and discharged so little that it was hard to get the cotton off at each dressing. In another week it had healed.

CASE 5. Mrs. Wm. S., Woman's Hospital, April, 1890.

April 24, 19 days after a laparotomy, an abscess containing half a drachm of pus discharged from the abdominal incision. Size of cavity $\frac{2}{3} \times \frac{2}{3} \times \frac{1}{4}$ inches. In this case I used plain absorbent cotton to wipe out and pack the cavity, and merely wiped off the surrounding skin, not using alcohol, iodoform, nor any drug. Absorbent cotton was laid over it. Dressings changed 4 times daily for 2 days, then 3 times. April 27 a piece of infected catgut was pulled up from the bottom of the wound, viz.: a part of that with which the peritoneum was sewed. May 1, discharge serous in character. May 3, 1 dressing in 24 hours. The wound kept contracting after this and the discharge remained serous, but every few days the hospital interne would get a little more catgut from the bottom. The wound was almost healed when the patient left the hospital, two weeks after the operation.

I learn that the wound did not heal for two weeks after the patient left, and suppose that infected catgut was still causing irritation. The fact that in spite of infected catgut the suppuration was so rapidly checked without germicides, and the wounded surfaces put in a condition for healing without suppuration, makes the case worth recording.

CASE 6. *Suppuration after Alexander's Operation.* Mrs. O.H.H., Woman's Hospital. Alexander's operation Jan. 14, 1890. One of the wounds suppurated. The nurse allowed a pus pocket to remain after the surface was healed, so that the patient went home in five weeks with a pus pocket which had a small outlet. After trying frequent antiseptic douches and dressings for 3 weeks longer I laid open

the wound under anæsthesia. Nevertheless another pus pocket formed and the same condition was renewed. I then laid it open as well as I could by one quick incision, and taught the husband how to use the dry dressings. In about two days he became discouraged because it was not doing well. I told him all that remained then was to go back to the bichloride or carbolic acid dressings. In about three weeks he called upon me and told me that he had tried the antiseptics again, and as it was almost immediately apparent that the wound was not doing as well, he went back to the dry dressing. In a short time a cure was effected.

I have applied the method, and am constantly applying it to all forms of simple wounds in which the absorbent material can be made to reach all parts of the wound, and in which I can obtain a frequent dressing for the first few days, or until the amount of discharge becomes inconsiderable. In suppurating wounds the dressings must at first be changed more frequently, but afterwards their treatment is not different from that of fresh wounds.

I also apply the principle to the drainage holes after laparotomy. As soon as the discharge has lost its bloody character, viz., on the second or third day, I remove the glass tube, and in case there is too much outflow to admit of closure of the orifice I push a folded strip of iodoform gauze down from 2 to 3 inches below the surface. This is changed every 24 hours, but pushed less deep each time.

In large wounds I have found gauze to act as well as, if not better than, cotton when it can be accurately adapted to the surfaces. The objection to its continued use is that granulations work into its meshes and are torn on its removal.

The use of alcohol to wash the surrounding skin, and iodoform gauze or sublimated gauze for packing may aid in the cure at times, but these antiseptics are not necessary, and are sometimes undesirable.

Between the cauterizations of venereal sores, the frequent change of dry absorbent cotton dressings has in my limited experience answered better than drugs.

I would formulate the method as follows :

1. Secure a large external opening.

2. Change the dressing often enough to prevent an accumulation of moist discharge.

3. Dry off the surfaces at each dressing as perfectly as possible.

4. Place absorbent material firmly against every part of the raw surfaces, but leave the packing loose in the middle so that the cavity may more readily contract.

5. Place an abundance of absorbent material over the wound, so as to be in direct contact with the packing—no powder or drug intervening.

6. Use clean absorbent cotton for small wounds, gauze for large ones.

7. Cleanse the neighboring skin at each dressing with dry absorbent material, or wash it with alcohol, but allow no water, or watery solution to come in contact with the wound or its surroundings.

THREE LAPAROTOMIES ON ONE PATIENT. RECOVERY.¹

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PETER M., laborer, æt. 30 years, a strong, stout man, was admitted to the hospital June 28, 1888. An examination revealed acute appendicitis, for which I operated the next day. The case was reported in the *ANNALS OF SURGERY*, February, 1889.

He returned to the hospital August 12, 1889, with a ventral hernia at the site of the operation. The hernia was pendulous, and formed a tumor as large as the double fist. In the operation to remove the diseased appendix an incision, four inches long, was made, commencing an inch above the center of Poupart's ligament, extending upward and outward. The cicatricial tissue covering the hernia was extremely thin.

I concluded the best procedure would be to make an incision in the center of the cicatrix, cut away all of the same, and bring the sound tissue together. In attempting to execute this idea, I made an incision in the center and in the long axis of the cicatrix, holding it well up, as I supposed, from the intestines. When the knife entered what we took to be the peritoneal cavity, I was mortified to find that I had cut directly into the intestine. Fluid fæces flowed from the wound. The finger introduced showed that the gut was adherent to the entire under surface of the cicatrix—that they were virtually one wall. I next made an opening into the cavity through sound tissue to the inner side of the cicatrix, introduced the finger and attempted to break up the adhesion between it and the intestine. I succeeded in this, but in doing so tore the opening in the gut still larger. I now had the gut denuded of four inches of its peritoneal coat, with a transverse hole in

¹Read by title at the meeting of the Missouri State Medical Association, May 7, 1890.

it occupying half its circumference. Resection being plainly the only feasible procedure, I then removed four inches of the intestine, together with sufficient mesentery to make the proper V-shape. The mesenteric wound was closed by a continuous silk suture.

In making the circular enterorrhaphy I used Senn's rubber ring, and was extremely pleased to find how quickly it enabled me to finish the operation. The entire operation, from the first incision to putting patient to bed was 35 minutes. I had, however, practiced the operation with the rubber ring quite often in the dead-house.

No fæces escaped into the peritoneal cavity. I had taken the precaution to pull out the intestine, empty it, and have an assistant compress it on each side of the wound to prevent the escape of fæcal matter. The cicatrix was cut away and the wound closed without drainage. It healed by first intention.

The patient stood the operation well. For seven or eight days he had some pain in the abdomen and vomited occasionally, but at no time did his pulse exceed 90, nor did his temperature reach 102° F., except on one afternoon. As he had been given a purgative before the operation, no attempt was made to move the bowels for a week, when enemas were given which produced several actions. About the tenth day a diarrhoea developed which lasted six or eight days. At that time a mild attack of dysentery supervened, which lasted about a week, after which the patient made a rapid recovery. He was out of bed on September 8, twenty-four days after the operation, and in a few days was doing detail work around the hospital.

Unfortunately, the parties watching the patient failed to discover the rubber ring in the fæces, although they were given positive instructions to carefully watch for the same. I take it that the diarrhoea was caused by irritation at the site of the rubber ring.

On September 30, while apparently in the enjoyment of excellent health, he was very suddenly seized with a most agonizing pain, referred to the umbilicus. He was in collapse in less than ten minutes after the seizure. Extremities were cold and clammy, and beads of cold perspiration were seen over his entire person. His pulse was very fast and weak; rectal temperature, 97.5°. He yelled with every breath.

I diagnosticated acute intestinal obstruction, stimulated him very freely, gave morphine hypodermically, and applied heat to the extremities. As soon as possible (in about a half hour) he was put under ether preparatory to laparotomy. His pulse improved under stimulants and ether, and during the operation was of fair volume. Just

before he was etherized he stated that the pain was most intense at the site of the old wound.

Remembering my former sad experience, I was careful to avoid the cicatrix left from the last operation, and hence made a parallel incision about five inches long, an inch to the inner side of the same. The intestines were found so inflamed, thickened and matted together, that it was quite a while before we could positively make out the exact condition, which proved to be three parallel coils or knuckles of intestines, bound down by a band. The inner coil was found to contain the portion through which the circular enterorrhaphy had been made. The band was cut and removed, adhesions broken up with considerable difficulty, and the intestine straightened.

Thinking, perhaps, some narrowing of the gut might have taken place at the site of the circular enterorrhaphy, and that this might in part account for the obstruction, we deemed it unwise to close the abdomen without definitely excluding this possible cause of obstruction. Of course, we understood that the band was ample cause for the obstruction, and ordinarily, we would have completed the operation as soon as the obstruction by the band had been relieved, but in this case the portion of the intestine formerly operated upon was one of the knuckles caught under the band, and in addition (which was very suggestive of the closure of its lumen) this part was particularly thickened and hard upon pressure. I attempted to determine the patulousness of the intestine at this part, as one would push his finger into the inguinal ring, with the scrotum ahead of the finger. Owing to the extreme thickness of the intestine, this could not be done. An incision large enough to admit the index finger was made, the finger passed in, and the site of the circular enterorrhaphy examined. A very slight constriction was found at this part; not more, however, than could be accounted for by the cicatrix. The wound in the intestine was closed, and, as there had been some fluid (serum) in the belly, it was washed out and a glass drain left in the lower angle of the wound. Patient was put to bed and hot bottles packed around him.

The operation lasted an hour and a half. A half hour after the operation his temperature was 98° , pulse 120, respiration 36. As there had been but little discharge through the tube, it was removed and the opening sewed up on the second day. The patient was then doing well, but on the third day the abdomen was considerably distended and painful to pressure. In the afternoon of that day his bowels moved spontaneously, after which the distention disappeared.

On the seventh day a fæcal fistula was noted. This, however, was not large, and remained open but four days. After this his recovery was uninterrupted. He remained in the hospital four months after the operation, working as a detail around the institution. When discharged he had grown quite stout, and was in the enjoyment of perfect health.

The accidental cutting of the intestine in this case teaches that in operating for ventral hernia the incision should always be made to the side of the cicatrix in sound tissue, as there are no means of determining beforehand in what cases adhesions have taken place between it and the intestine.

Possibly it might have been better not to have operated on this patient; the reduction of the mass and an elastic support might, perhaps, have been better. But when we consider that the tendency of such a hernia is to steadily enlarge, even with elastic support, especially in the laboring classes, we must believe that the operative procedure is the better one.

Had I to perform the operation to-day, I should close the ends of the intestines, employ lateral anastomosis, and should not resect the mesentery, but would close it, as advised by Senn.

EDITORIAL ARTICLES.

DELBET ON THE DRAINAGE OF THE PERITONEAL CAVITY.

Delbet after the experiments detailed in the May number of the ANNALS OF SURGERY, continues his interesting article in the *Annales de Gynecologie et d'Obstet*, (March, 1890) with the consideration of the subject of the indications for drainage.

These he considers under several heads.

Duration of the operation.—This indication recognized by Wiedow is considered only of importance when the length of time depends on conditions that require drainage.

Extensive adhesions.—Many surgeons consider this indication clear, but, different varieties of adhesions should not be compared to one another. Sometimes extensive adhesions tear without hæmorrhage and do not call for drainage. At other times intimate and vascular adhesions give rise to excessive hæmorrhage and the drainage tube does not suffice, and the tamponade is required. The question of adhesions is very complex. In general, intimate and vascular adhesions are often an indication for drainage or tamponade.

Hæmorrhages.—This is only a question of hæmorrhage from the capillaries or from the vessels which one cannot tie. During the operation compression, hot-water, or the actual cautery is used. But when all these methods have been tried without entire satisfaction what must we do? It is well known that the peritoneum is capable of absorbing blood and can we therefore assume that it is useless to make drainage. It would be a mistake to assume that the same results would follow in a peritoneal cavity whose changed conditions gave rise to hæmorrhage, as in the case where defibrinated blood is injected into healthy peritoneal cavities.

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The bleeding surface produced by tearing the adhesions in the majority of cases is in the cul-de-sac or near it, that is to say the most dependent portion of the pelvis. It rests here in contact with the altered tissues, which not only will not absorb it but where the tendency is to pour out more blood.

Delbet does not think in such a case the operator should be satisfied to simply close up the abdomen; he also does not think drainage would suffice, for it would take off the abdominal pressure because the tube puts the abdominal cavity in free communication with the atmospheric pressure and the hæmorrhage is more likely to continue. The indication is to produce a checking of hæmorrhage, and there is nothing better than the aseptic gauze tamponade with or without the sac of Mickulicz.

Tear or loss of substance of the peritoneum.—The tear or loss of substance of the parietal peritoneum is not so serious a complication as it was formerly considered. It is to Sklifossonski that we are indebted for precise knowledge on this subject. Sanger has shown that the resection of extensive portions of the parietal peritoneum has not apparently given rise to any trouble, but it is certain that the intestinal coils attach themselves to the peritoneal wound and in these cases recovery is only obtained at the price of extensive adhesions. When the peritoneum has been torn or resected he made every effort to cover over the tear or loss of substance. It is very easy to suture a tear and one can succeed even with loss of substance, thanks to the mobility of the parietal peritoneum. In some cases however this is impossible and the author does not think it advisable to attempt to cover the abraded surface by a graft of epiploon. This complicates an operation already long and severe for an uncertain result. It is an active source of possible infection and it prevents absorption of the blood.

In this case there is nothing better to do than to render the wound surface extraperitoneal and shut in the surface by adhesions in an aseptic condition. Here again is the tamponade indicated.

Remaining diseased and septic tissues.—One sometimes finds tumors so adherent that it is almost impossible to recognize their limits. To free them it is necessary to enucleate and we then have left a sort of sac formed by diseased tissues.

In another case, a tube, for example so firmly adherent to the rectum and great vessels that the freeing of the adhesions might rupture these important organs, rather than run this risk it is better to leave part of the tumor. In these cases, of which it is not necessary to multiply examples, there remain in the bottom of the pelvis tissues altered, often septic, in quantity more or less considerable. These tissues may give rise to dangerous secretions. It is not sufficient to conduct them by a tube, because the tubes do not insure the evacuation of the liquids. Besides this might prove dangerous because they would be obliged to traverse healthy portions of peritoneum. In this the indication is to render these tissues extraperitoneal.

There are many methods of accomplishing this. If the sac can be brought to the abdominal incision, it is best to fasten it in this position. Often it is impossible to draw it to the abdominal incision and yet its sides can be drawn together, as done by Martin, who then drains this extra-peritoneal sac by the vagina. When there remains but a small part of the tumor and it cannot be treated by either of these methods, there yet remains the antiseptic tamponade.

Rupture into the peritoneal cavity of septic areas.—Only those ruptures that occur in the course of an operation are referred to. The indication here is to wash the septic material out. M. Quénu thinks that in case of rupture of purulent pockets drainage may supplement lavage. Certainly success has been obtained in these cases by the drainage and without lavage. But it would be hazardous to draw an argument from these successes of drainage as against lavage for we know that the virulence of the contents of the tubes differs, even when it has a purulent appearance and one cannot say in those fortunate cases spoken of whether the fluid was septic or not. Delbet thinks that in case of septic infection, during an operation with the peritoneal cavity open, that lavage meets the indication well where drainage meets it poorly, and the surgeon who wishes all the chances of success on his side will use it.

So much for drainage; it is perhaps a supplementary method of precaution to have recourse to, but one of not very great efficacy.

Rupture of the Intestine.—After suturing a torn intestine it is a great

temptation to place a strip of iodoform gauze so that it leads from the sutures out through the abdominal wound. This gauze will not interfere with the union of the intestine and will prevent trouble if one of the sutures should give way. This accident does not usually take place until two or three days have elapsed and at this time the gauze is shut in by adhesions, so that instead of a grave peritonitis, we have only a fæcal fistula. Of course this method would not be of use where the intestine was freely movable, for it would quickly become displaced. It would only be useful in a portion already affected by inflammatory action and fixed in its position.

Peritonitis.—Foci of pelvic peritonitis which one has left in the pelvis have already been considered. When there is a generalized peritonitis at the time of operation, all surgeons consider drainage to be indicated.

Ascites.—In case of ascites of mechanical origin it is perhaps not necessary to drain, but in case of ascites due to irritation or inflammation it might be better to use drainage. The subject evidently is not very clear to Delbet. The appearance of the fluid is of some aid in coming to a conclusion. Chyliform ascitic fluid, says Sebileau, always indicates a chronic peritonitis. Gelatinous fluid indicates the rupture of a cyst or a secretion from its external vegations. Bloody ascites ordinarily accompanies malignant tumors. These indications though very incomplete will often be sufficient to enable one to judge if the ascites will persist or disappear after the ablation of the tumor and subsequently if drainage is necessary or not.

Irrigation by the drainage tube.—Bardenheuer irrigated by the tube every 24 hours. Martin at first imitated him but in 1882 he renounced the irrigations on account of an accident, which will be mentioned. In America Sims devised a double current tube to facilitate lavage, but to-day irrigations by the tube, very rightly, are almost entirely abandoned.

One of Martin's patients, an old decrepit woman, fell into a collapse after a second washing and died without a trace of septic infection.

In another case each lavage caused attacks of vomiting. These experiences are exceptional, but it is imprudent to force even an aseptic

fluid into the peritoneal cavity, when we cannot be sure to make it return even with the aid of an aspirating force. The absorption of this solution may prove troublesome. At the end of 24 or 48 hours when the adhesions are established, or about to be established, the injection may break them up and establish a communication between infected extra-peritoneal foci and the peritoneal cavity.

Time and manner of withdrawing the drainage.—Some surgeons remove the tubes at the end of 24 or 48 hours. If the indication as studied by Delbet be accepted, the tubes should not be removed until adhesions are formed.

It is impossible to indicate the precise time for their removal as this is a matter of surgical tact and differs with each case, but if a drain remains in place for 48 hours adhesions are formed and it is shut in by a little canal so that when it is removed there remains a canal the size of which depends on the size of the drain used.

Too much credit cannot be given M. Delbet for this experimental work. It clearly points out the field of usefulness of the drains, which by causing adhesions shut off the peritoneal cavity from suspicious points.

A. H. BUCKMASTER

KUMMELL ON THE SURGERY OF THE GALL-BLADDER.¹

Since Langenbuch first totally extirpated the gall-bladder, it has now become a rule that surgeons must interfere in all cases of disease of this viscus which have not been relieved by internal medication, but the operation to be chosen can not be fixed beforehand; it must be modified to suit each case.

Operative interference is indicated in cases of formation of gall stones and their sequelæ, hydrops, and empyema of the gall-bladder, closure of the ductus choledochus, and also in the case of tumors preventing the flow of bile; but these tumors are only found at the time of operation.

¹Deutsche Medicinische Wochenschrift, 1890, No. 12.

Operative interference is not so much required in the case of gall-stone with biliary colic, as in the cases where these calculi set up inflammation in and around the gall-bladder, which leads to the formation of adhesions, or even ulceration and perforation, the formation of these adhesions being accompanied by a feeling of continuous pain or pressure. It is not rare to see the gall-bladder firmly adherent to the liver by strong connective tissue bands, or even encapsulated, or sometimes it may be adherent to coils of intestine, perforation set in, and the calculi escape in the bowels.

Closure of the cystic duct, due to any cause, leads to retention of the bile in its natural reservoir; this becomes more and more distended, and its contents may become purulent, and we have the picture of hydrops or empyema of the gall-bladder. Such distension may sometimes reach an enormous size and be mistaken for an ovarian cyst.

The following case is an example: A woman, æt. 50 years, had suffered for many years from what she called stomach trouble, and noticed six months previously, during one of these attacks, a slow and steady increase of her abdomen. From time to time she had severe pain, which disappeared by the employment of household remedies. On examination, the thoracic and abdominal organs appeared normal. She was anæsthetized, and on the right side of the abdomen a tense, elastic tumor was found; this tumor seemed attached to the uterus, but was not lying next to it. The right ovary could not be felt, and a connection between the tumor and the abdominal organs could not be made out. The diagnosis of a right ovarian cyst was made.

Two days after the examination the patient complained of severe pain in the abdomen, vomiting set in soon, accompanied by marked meteorismus, the pulse became small and thready, the extrêmities cold, in fact, all the symptoms of perforative peritonitis. The patient died in a short time. On opening the abdomen a diffuse suppurative peritonitis was found. The abdominal cavity was filled with a large quantity of purulent fluid, in which was a large number of gall-stones. It was then seen that the gall-bladder which had been filled with calculi and purulent fluid had attained an immense size and ruptured. The tumor reached down in the pelvis and was adherent posteriorly to the right ovary.

Another and not less weighty indication for operation is the closure of the common bile duct with its accompanying cholæmia. It is true that some serious cases are cured by the spontaneous disappearance of the obstruction, but as soon as symptoms of cholæmia set in, the only chance of saving life is by opening the gall-bladder, and in those cases simple cholecystotomy is the best operation. The operation is not radical, but it provides a free escape for the bile. Often, after the operation, the stone is spontaneously evacuated, or it may be removed by instruments.

The question of diagnosis of disease of the gall-bladder is very easy in a case of simple biliary colic, with its sudden intense pain, scarcely relieved by narcotics, and especially easy when accompanied by icterus. More difficult are the slow chronic cases, with frequent exacerbations, accompanied by closure of the cystic duct. Icterus is absent, the patient complains for a long time of pain in the right side or in the region of the liver, which they often call cramps in the stomach. If it is possible to feel a tumor under the free border of the liver, this is a great help in the diagnosis. In favor of empyema of the gall-bladder there is the tumor, the absence of icterus, the long existence of paroxysmal pains, and the presence of a dull heavy pressure in the hepatic region, which does not disappear between each attack. The recognition of closure of the ductus choledochus is easier to recognize on account of previously existing icterus, and by previous attacks of biliary colic.

In difficult cases an exploratory incision ought always to be made.

The differential diagnosis between tumors of the liver and those of neighboring organs is often extremely difficult.

As for the methods of operation which have been presented there are five important ones.

1. Cholecystotomy, the fixation of the gall-bladder in the abdominal wound and the opening it.

2. The ideal cholecystotomy, opening the gall-bladder, evacuating its contents, sewing it up and replacing it in the abdominal cavity.

3. Cholecysto-enterostomy, the formation of a fistula between the small intestine and the gall bladder (v. Winiwarter).

4. Cholecystotomy and ligature of the cystic duct (Zielewicz).
5. Cholecystectomy (Langenbuch).

Cholecystotomy is without doubt the oldest and safest of these operations. It is done by opening the abdomen and fixing the gall-bladder in the wound, and either opening the latter immediately, or waiting till adhesions have formed and then opening.

Dr. Kummell has operated on two patients by the above method, in one case opening immediately, on account of symptoms of perforation, and in the other case opening the gall-bladder when it was firmly adherent to the wound.

As to the ideal cholecystotomy specially recommended by Küster in cases of solitary stones, the operation does not present many advantages, for there is always danger of the giving way of sutures and extravasation of bile into the abdominal cavity, and although the results obtained are quicker and more brilliant than by the ordinary method, it is not so safe.

The ingenious operation devised by Winiwarter, and later on carried out by Kappeler, is the best in cases of permanent obstruction of the ductus—choledochus, as it brings back the bile into the intestine.

The operation practiced in a case by Zielewicz, of ligating the ductus cysticus, with the subsequent formation of a biliary fistula, when the total extirpation of the gall bladder was impossible, is worthy of a more extended trial. Cases are often seen where the desirable total extirpation of the gall-bladder is impossible, on account of its firm adhesions, but in which, after ligature of the cystic duct, a prompt atrophy of the organ may be expected. This operation might be employed successfully in those cases where not only extirpation is impossible, but where a biliary fistula can not be made on account of the extreme smallness of the organ and its being overlapped by the liver.

The cholecystectomy of Langenbuch, or the total extirpation of the gall-bladder, would be the most radical, and remedy all evil, if the formation of calculi only took place in the gall-bladder, but there are a number of authenticated cases reported in which the formation of gall-stones took place in the liver, and the danger is that one of these calculi should lead to closure of the ductus choledochus and its subse-

quent symptoms, and the only remaining thing to be done would be to crush the stone within the duct, as was once done successfully by Crude.

Dr. Kuilmell reports two cases in which he extirpated the gall-bladder; the first case died from collapse 20 hours after the operation, and the second recovered completely.

F. C. HUSON.

BARDENHEUER ON RESECTION OF THE ARTICULAR CAVITY OF
THE HIP ON ACCOUNT OF SEPTIC EPIPHYSEAL
INFECTION¹.

It is pretty well established at present that in cases of inflammation of the epiphyseal line, it is the proper treatment to separate the epiphysis from the diaphysis before any infiltration or suppuration of the soft parts takes place. When the general symptoms point to a septic inflammation of the epiphyses, the indication for operation is a sharp permanent pain caused by palpation or percussion.

Such early interference always cuts the process short, and prevents the formation of necrosis or of central bone abscess and the extension of the disease to the joint, and general infection. In all cases where Bardenheuer did an early trepanation for this trouble he never saw necrosis or any other sequelæ develop. But in cases where the operation was delayed till suppuration was recognized by palpation he has seen the separation of epiphyses and death follow from general infection notwithstanding the operation. Bardenheuer is of the opinion that in septic inflammation of the epiphyses the disease is primarily a local one, and only after it is fully developed does it cause the disastrous results with which we are all familiar. He bases himself on the results of practical experience, and the results after early operation are so brilliant, while on the other hand death only follows in those cases operated too late, that he cannot help being an enthusiast on early operation.

¹Deutsche Med. Woch., 1890. No. 19.

The point for diagnosis is comparatively easy in most of the bones of the extremities, but difficult in those plentifully covered by soft parts, such as the hip-joint where the primary seat of the disease is not easy of access, and in these cases, even when the general symptoms point to septic inflammation of the epiphysis it is often very difficult to find out which one is primarily affected, and here the prognosis is much less favorable, from the fact that the primary seat of the disease is discovered too late.

Being convinced of the importance of early operation on the epiphysis Dr. Bardenheuer often operates at a time where the ordinary on-looker would find it difficult to find any alteration in the bone, only a little colored fluid escapes from the spongy alveoli, but the immediate fall in the fever and the complete absence of pain show that the operation was indicated.

Lately the writer has had the chance to see three cases of epiphyseal inflammation of the articular cavity of the hip joint, and in these cases he resected the articular cavity through what he calls his symphysis incision.

CASE I. Boy, æt. 16 years, had for five weeks been suffering from repeated chills, followed by fever, and could not be moved in bed without suffering extreme pain, which was specially located in the left knee-joint. The thigh was strongly flexed. The patient was somewhat stupid and his general appearance was typhoid.

Examination, under chloroform, showed perfect freedom of all the joints of the left lower extremity. Examination by rectum revealed tenderness over the region of the acetabulum, together with some swelling. The iliac fossa was perfectly normal but inguinal glands were much enlarged. A diagnosis of septic epiphyseal inflammation of the acetabulum was made, and the symphyseal incision was made, the periosteum carefully loosened along the iliac fossa into the lesser pelvic cavity where the suppurating focus was found and incised. The triangular junction of the bones forming the acetabulum was found opened and roughened, the periosteum destroyed and much pus escaping from the articular cavity. The head of the femur was dark colored. The whole floor of the articular cavity was chiseled away and the ab-

abscess cavity drained by a tube passing forward and escaping under the pubic arch. The upper wound was packed with iodoform gauze. The subsequent progress of the case was excellent. A small piece of the head of the femur came away. The operation had the desired effect of immediately cutting short the septic process. Without this interference in all probabilities the child would have died from sepsis, unless the abscess had come up through the pelvis and opened in the groin, or had broken through the capsule of the joint and thus come to the surface. In the latter case a subsequent resection of the hip would have been needed and a much worse functional result would have followed. This case also shows the possibility of resecting the articular cavity through the pelvis without its being necessary to resect the head of the femur at the same time so as to secure proper drainage.

CASE II. Girl, æt., 2 years, had suffered for 17 weeks from protracted and severe fever which at first resembled typhoid, but many symptoms were missing, especially the intestinal ones. At the end of the seventh week a tumor developed in the groin and in the iliac fossa, which was opened, and five weeks later another formed below Poupart's ligament, to the inner side of the femoral vessels, as well as 3 to 4 cms. below the inferior iliac spine; and a second incision had to be made. The fistulæ secreted large quantities of pus and the patient grew rapidly weaker. In the thirteenth week a sharp hæmorrhage took place from the internal incision, which hæmorrhage could only be controlled by the application of forceps. This weakened the patient still more. Examination by the writer apart from the above described condition showed an impediment to flexion of the thigh. Examination by rectum revealed a large accumulation of pus on the left side of the true pelvis. The region of the left acetabulum was thickened and pressure on this joint caused profuse flow of pus through the fistulæ.

The case was one of septic epiphyseal inflammation. A suprapubic exploratory incision was made reaching from the symphysis pubis to the outer third of Poupart's ligament, and the peritoneum was carefully dissected backward for quite a distance. An abscess was found on the inner wall of the lesser pelvis, and in the region of the acetabulum there was a bony fissure through which pus escaped. The

whole of the acetabulum was resected and the peritoneum pushed aside.

The patient was very feeble. Died in the course of the afternoon, six hours after the operation. Death was due partly to collapse and partly to sepsis.

CASE III. Child, æt. 5 years; came to the hospital on account of a large abscess in the iliac fossa. The trouble had set in after a severe fever which had gradually diminished. The abscess was freely incised by the House Surgeon, but notwithstanding this supuration still kept up. Examination showed the presence of an abscess near the acetabulum, but the movements at the hip-joint were yet good. On exploring the pelvis by the symphyseal incision this abscess was located and opened, and the region of the acetabulum which was found to be denuded of periosteum was resected. The head of the femur was covered with granulations.

One week later, on account of the continuation of the fever and suppuration, the head of the thigh bone was resected in the typical manner, and soon after the patient made a perfect recovery.

Dr. Bardenheuer is of the opinion that this exploratory incision and this method of resecting the acetabulum should be more frequently employed, for many cases of tubercular disease of the acetabulum are discovered too late to be operated on. F. C. HUSSON.

ON THE DEVELOPMENT OF CALLUS AFTER FRACTURE OF LONG BONES.¹

The author contributes a very valuable monograph on the subject, embodying his own experimental and clinical researches, which were conducted partly in Professor N. V. Sklifosovsky's clinic, in Moscow, partly in his own surgical wards in the Poltava Zenesky Hospital. The cardinal point of the work was to study the development of callus, *a*, in such cases where fractured bone retained its periosteum, and, *b*, in such where fragments were stripped of their periosteum at

¹Moscow Inaugural Dissertation, 1889, by DR. LEONID G. VASILIEFF, of Poltava, South Russia.

a more or less considerable area. The experiments (36 in number) were carried out on puppies, adult dogs, and rabbits. The essential outcome of the author's researches may be summarized somewhat as follows:

A. *Fracture with retained periosteum.* (1.) The formation of callus represents a regenerative process *sui generis*. It occurs totally independently of inflammation which makes its appearance immediately after fracture to attain its height about the end of a third day after the injury. The inflammatory process does not in the least promote the development of callus; on the contrary, it distinctly interferes with the latter, reparation of bone beginning only after the subsidence of inflammation. (2) The starting point of or impulse for the appearance of the reparative process (as well as of the inflammation) is constituted by irritation of the periosteum and bone-marrow, induced by traumatic violence and consecutive lesions (contusion, crushing and rupture of tissues, hæmorrhage). (3) Leucocytes which escape from vessels during inflammation never transform into osteoblasts, their functions being, probably, limited to absorbing detritus of tissue and blood-clots. At all events, they ultimately undergo disorganization and disappear. (4) The regenerative process begins on a third day after fracture, appearing first of all in the osteogenic layer of the periosteum. The initial phenomena consist in a karyokinetic proliferation of cells of the larger as well as of the intima and adventitia of local blood-vessels. Such newly-formed elements subsequently transform into osteoblasts, which similarly multiply themselves by a karyokinetic scission. In the presence of local friction or pressure, the young cells may transform into cartilaginous elements, instead of osteoblasts. In the course of time, some of such cartilage-cells undergo atrophy to yield their place to newly formed osseous and connective tissues; most of them, however, transform, by way of metaplasia, into bone tissue, the impulse for the metaplastic process being given by vascularization of cartilaginous islets. (5) Osseous metamorphosis of osteoblasts proceeds in the way described by Waldeyer and Streltsoff; that is, peripheral zones of their protoplasm become impregnated with lime and coalesce with analogous zones of adjacent osteoblasts to

form an intercellular osseous substance, while a central portion of protoplasm together with the nucleus transforms into bone-corpuscle and bone-cell. (6) The bone tissue formation always begins at some distance from the fractured surface of the fragment to gradually advance to the latter and into the inter-fragmental space. (7) At the same time, osteoblasts covering the walls of the central medullary canal (which elements partly preexist therein, but mostly penetrate into the cavity through Haversian canals from proliferating osteogenic layer of the periosteum) similarly transform into bone-tissue, the process again starting at some distance from the fracture surface to gradually reach the latter. The bone marrow is thus crowded out into the interfragmental space to undergo transformation first into connective and cartilaginous tissues and then into osseous callus. (8) Any blood clots which are mostly lying in the interfragmental place are gradually absorbed, being replaced by ossifying bone-marrow. They never undergo metamorphosis into callus. They behave like foreign bodies, interfering with the reparative forces and retarding the development of an interfragmental callus. (9) Simultaneously with the throwing out of callus, old bone-tissue about the fragment end becomes disintegrated and absorbed, being replaced by a newly-forming one. (10) Vascularization of thickened periosteum continues since a third day after fracture and proceeds by way of karyokinetic scission of cells of the adventitia and intima. (11) The callus formation ends with a complete consolidation of fragments by newly-formed bone-tissue, which requires over two months (under favorable conditions). When examined before the term, callus proved to contain more or less numerous islets of connective or cartilage tissue, scattered chiefly over the interfragmental space.

B. *Fractures with stripped off periosteum* (*“Fracturæ cum oblatione periostei”*). (1) Consolidation of fracture proves to be still possible even in cases complicated with loss of the periosteum. (2) The sources for an external callus prove to be, *a*, the adjacent intact periosteum; *b*, periosteal shreds and strings which are always found attached here and there to the fragment's surface; *c*, cellular elements of Haversian canals. (3) The development of an internal callus proceeds

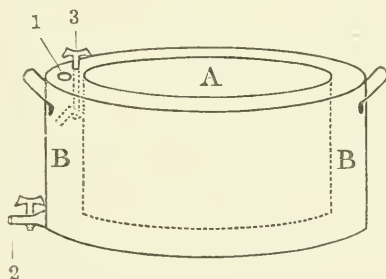
nearly parallel with that of an external one, its sources being, *a*, osteoblasts of bone-marrow; *b*, osteogenic elements of adherent shreds of the periosteum; *c*, those of Haversian canals. (4) An interfragmental callus develops only after the external and internal one has attained the fractured surface. It is supplied by, *a*, bone-marrow of the central medullary canal; *b*, internal callus; *c*, osteoblasts of Haversian canals emerging on the fracture surface; *d*, those of external callus. (5) Surrounding soft tissues do not take any direct part in the callus formation; they only become adherent to callus and may give some additional support to the latter. (6) Mobility of fragments always lasts a good deal longer than in cases of fracture with retained periosteum. (7) Callus is always weaker and less bulky. (8) Consolidation proceeds at least twice as slowly as in the case of retained periosteum. (9) Sequestration of the fragment's end occurs very frequently. (10) Non-union and formation of false joints are similarly most frequent. (11) On the whole, destruction of the periosteum on the fragment's end must be regarded as a very grave complication, making the prognosis materially worse. (12) In all cases of compound fractures of long bones, the state of the periosteum should be inquired into, and the loss of the periosteum regarded as a more important complication than the open wound itself. (13) Such cases imperatively demand a strictly antiseptic management.

VALERIUS IDELSON.

INDEX OF SURGICAL PROGRESS.

GENERAL SURGERY.

I. An Apparatus for Sterilizing Steel Instruments by Steam Without Rusting Them. By MR. C. W. CATHCART (Edinburgh). The author, acting on the statement of chemists that rust only occurs when iron or steel is exposed to moisture in the presence of carbonic acid, and that all carbonic acid may be driven out from steam by boiling for some minutes, has devised the following simple and cheap apparatus, which fulfills both these indications. An oval tin pot (A) like a fish-kettle, and measuring 16 inches long, 9 inches broad, and 6 inches deep, is surrounded on all sides, except at the lid,



by a similar vessel (B), 1 inch of space being left between them. The outer compartment (B) is provided with (1) a hole for filling in the water, which can be plugged by a cork; (2) with an exit tap for emptying, and (3) with a stop-cock near the top, which opens and shuts communication with A. A has a tightly fitting lid.

The instruments to be sterilized are placed in A. They may either lie on the bottom or be in glass tubes or metal boxes. The lid of A is shut down and water boiled in the outer vessel (B) by a bunsen

burner or on the fire. At first the steam is allowed to escape for the double purpose of dry-heating the instruments and of driving off the carbonic acid from the water. In ten or fifteen minutes the stop-cock is opened between A and B, and the filling hole in B plugged with a cork. Steam rushes into and fills A and escapes at crevices round the lid. The instruments can in this way be steamed for as long as is required, after which the stop-cock is turned off again and the lid taken off. The steam at once escapes and the instruments are found dry and free from any trace of rust. The smaller boxes containing instruments will have some vapor condensed on the inside of their lids, and there only, because the cold air from above cools the lids first. After the lids have been wiped dry on the inside, the rest of the boxes and their contents will be found to be dry also. The instruments free in A will be quite dry.

During the steaming, some vapor condenses on the inside of the lid of A in spite of its being protected by a felt cover on the outside, and sometimes the condensed water drops on to the instruments or boxes below as the lid is being taken off. It can of course be at once wiped off, but is a disadvantage. To obviate this inconvenience he has fixed to the under side of the lid a piece of lint, which catches any drops that fall. Hooks are fastened at either end of the downward projecting lip of the lid. Strings through these fasten the sheet of lint to the lid.

Half a gallon of cold water in this sterilizer takes about half an hour to come to the boil with an ordinary bunsen burner. This quantity takes about two hours to boil down after it has reached the boiling point.—*Edinburg Med. Jour.*, Aug., 1890.

II. On the Results Attained by Modern Surgical Experiments in the Field of Suture and Plastic Restoration of Defects in Highly Organized Tissues, "Also the Application of Absorbable and Living Tampons in Surgery." By DR. GLUCK (Berlin). Plastic operations as practiced in ancient surgery and even in modern times by Dieffenbach and Langenbeck and other surgeons were concerned mostly with autoplasmic methods, pedicled

flaps which were united to the parts by a bridge of tissue of greater or less width. The author has convinced himself that in a number of cases in which in spite of twisting or torsion of this pedicle of tissue, or extravasation of blood underneath the flap, a positive result was attained, this was due not so much to the existence of the narrow pedicle of the flap of tissue as to the inherent vitality of the tissue itself. A division of this uniting pedicle of tissue converts the autoplasmic in a transplantation or implantation of a foreign body. The autoplasmic *cutanée à lambeaux* is the most ancient of plastic methods; it includes the autoplasmic nerveuse, tendineuse, musculaire, osseuse and periostite à lambeaux. This method was perfected upon the skin but only isolated instances of its practice occurs on any of the other tissues.

The author was convinced that the autoplasmic methods really dealt with the transplantation of tissues. The so-called nourishing bridges of tissue scarcely deserve the name. Autoplasmic moreover reduces the volume, nutrition and the resistant vitality of the parts which it is intended to restore and reconstruct. The necessary tension of suture also predisposes to necrosis. In view of these facts the author has undertaken the actual transplantation of homologous and heterologous substances, absorbable and non-absorbable, aseptically with the aid of exact suture and fixation. As a further elaboration of this idea the author was induced to pass from transplantation and nerve suture to the plastic replacement of all higher tissues, as also the investigation of absorbable and living tampons. In the above schema must also be included the experiments of the author in proving the possible closure of wounds in the larger blood vessels, with the maintenance of the circulation, absence of all formation of thrombus, and the formation of a resistant cicatrix. According to the author's researches, the surgeon is able to-day to replace and reconstruct defects in highly organized tissues, and by the aid of the absorbable and living tampons, to support and fill spaces and pockets, to preserve exposed tendons and bone, to prevent hæmorrhage, reduce secretion, thus securing cicatrization without reaction. The suggestion and method of the author's in obliterating the inguinal canal in the radical operation for hernia by means of transplantation has been followed out by Thiem with the catgut tampon

by the author by means of a disinfected ivory thimble and by Trendelenberg with the bone of the humerus taken from another individual. It was not the vitality of primary union in the histological sense alone which made a functional result possible but the healing in the tissues of the transplanted material without regard to the maintenance of structure or specific function of the implanted material and without any regard to energetic reaction, in individual cases specific formation of organized tissue which aided a return to function of the reconstructed part. The technical principles of the different plastic operations were exact suture in all higher tissues, relative tension between peripheral tendon and muscle body, also smoothness of mobility upon subjacent tissues in tendon and muscle plastic, care in fixation of fragments, best attained by the introduction of ivory cylinders or fresh bone in the medullary canals of bones. The utilization of filagree like, or egg shaped or elliptical, or spherical frame work for the purposes of arthroplastic aided by ideal asepsis and non irritant material. In the case of nerves only is it necessary that nerve regeneration should take place after suture and plastic in order to restore continuity and function. In this connection the author has formulated the methods of healing of nerves after suture.

1. Regeneration by means of division and out growth of the central axis cylinder with connective tissue atrophy of the peripheral extremity, also the formation of a new nerve from the central end, (Remak's regeneration). Duration of the process according to the severity of the case from 1 to $1\frac{1}{2}$ years.

2. Secondary union after nerve suture and transplantation. Formation and out growth of new fibers from the central extremity with also degeneration of some of the peripheral nerve fibres with also a spontaneous regeneration of the same, some of the peripheral axis cylinders persisting. Should the organic disintegration of the divided stumps be hastened on the 40th, 60th or 80th day by nerve suture, or a fortunate accident or transplantation of nerve then we may have the seeming paradox of a primary union of nerves in secondary nerve suture. In this way alone can we explain cases of primary union in secondary nerve suture as recorded by Langenbeck and Landerer. The

secondary union of nerves requires $\frac{1}{2}$ to 1 year for the restitution of function.

3. Primary union after restoration of conduction within eight days after operation, then progressive restoration of function to complete restitution which results within $\frac{1}{4}$ to $\frac{1}{2}$ year.

The conduction is restored by means of specific granulation tissue. Author's and Wolbergs neuroblasts unite the peripheral and central axis cylinders and are transformed into amyeline nerve fibres after few days. The degeneration of the peripheral extremity is only to be found in few nerve fibers. The early appearance of central impulse prevents paralytic phenomena of Waller's degeneration. In the discussion following the above, Kolliker (Leipzig) thought that the tubulization of nerves after Socin with absorbable drain yielded best results. Gluck claimed priority for tubulization.—*Beilage z. Centralb. f. Chir.*, 1890, No. 25.

III. The Amount of Hæmoglobin in the Blood in Surgical Diseases, with Special Reference to Restoration after Hæmorrhage. By PROF. MIKULICZ (Konigsberg). In the above, Mikulicz presents the results of the labors of his pupil, Max Bierfreund, and himself in determining how soon after loss of blood does regeneration occur, and what role does age and sex play in the process, and, secondly, do constitution and disposition bear any relation to the variations found in the amount of hæmoglobin in the blood and the regeneration of losses of blood. The method of investigation consisted in determining the amount of hæmoglobin by means of the Fleischl hæmometer before operation and then repeating the examination at intervals of two to four days after to determine the rapidity of restitution. The ideal amount of 100% of hæmoglobin was found in robust young men of the third decennium of life, the highest mean 92%, was found in men in the third decennium. The results in females show that, as a rule, the percentage of hæmoglobin is less in the female than in the male subject. On the whole, the results corresponded with those of Stierlin, males 87.8%, females 84.5%.

Regeneration occurred most rapidly in the third and fourth decen-

nium of life in men and slowly in children and old age. This confirms the old belief that children and aged persons bear losses of blood badly. The mean time for regeneration in women in the third decennium of life was 14.7 days, corresponding closely to the figures of Meyer, who found that regeneration of the original amount of hæmoglobin occurred in 14 days in the parturient woman. The amount of the loss of blood also influenced the period within which restoration of the normal amount of hæmoglobin occurred. Losses which represented a diminution of 15% in the amount of hæmoglobin required 14.2 days for a return to the normal; a deficiency of 20% of hæmoglobin required 19.9 days; 25% hæmoglobin deficient required 21.6 days; greater deficiencies required an average of 29 days for restoration. The minimum time of regeneration varied with the amount of blood lost. An amount of loss showing hæmoglobin deficiency of 15% requires on the average a minimum time of 3.5 days, whereas in cases showing over 25% deficiency in the amount of hæmoglobin required 9.6 days as a minimum for restoration. The greatest loss of hæmoglobin was that of a woman in whom a fibroma of the abdomen was extirpated. In this case the hæmoglobin sunk from 70% to 22%.

In two cases where death ensued with all the symptoms of acute anæmia, the hæmoglobin sunk to 15% to 17%. Mikulicz thinks that many cases which die on the 2d or 3d day may be traced to anæmia or oligochromamie. Simple narcosis (chloroform without any loss of blood) may reduce the hæmoglobin 5 to 10%. In various diseases which have an unfavorable influence upon the economy, the following was found: In 79 cases of local tuberculosis the hæmoglobin was present on the average of 63% instead of 81.6%. The regeneration after operation was prolonged at least a week. In 10 cases of tertiary syphilis the amount of hæmoglobin was present in reduced amount before operation. The time of regeneration was not markedly influenced. In benign tumors the amount of hæmoglobin was but slightly below the normal. In cases suffering from malignant tumors the amount of hæmoglobin reached on the average only 60%, and the time of regeneration was markedly prolonged. Whereas in local tuberculosis after complete extirpation and absence of return of disease, the

amount of hæmoglobin passed the standard before operation, this was not the case with malignant tumors; the hæmoglobin here after operation never reaches the normal healthy standard or passes below the percentage held before the operation.—*Beilage z. Centralb. f. Chir.*, 1890, No. 25.

IV. Æther and Chloroform Narcosis. By DR. KAPPELLER (Germany). The author shows that the present method of administering chloroform is imperfect from a physiological standpoint. The accidents which have hitherto occurred should be attributed to the method of administration rather than to the agent itself. The Clover apparatus is imperfect and the author has devised a method and apparatus by which a maximum strength of 14.5 grams of chloroform to 100 litres of air is attained. The strength of the mixture can be so graded that at the termination of narcosis the chloroform per-cent is less than at the outset. In a series of 200 narcoses an average of 13.3 grams of chloroform only were used. In a narcosis of 2 to 3 hours, only 40 to 56 grammes of chloroform were used. In most cases the narcosis was complete in 7 to 8 minutes. Vomiting was present in 7% of the cases.

In the discussion which followed the above, Bruns, of Tübingen, and Stelzner, of Dresden, supported æther as an anæsthetic. Zielwies had some weeks' experience with the mixture of Billroth. Kappeller thought that the effect of chloroform upon the pulse was slower than that of æther.—*Beilage z. Centralb. f. Chir.*, No. 25, 1890.

V. On the Treatment of Tuberculous Joint and Cold Abscess with Iodoform Injection. By PROF. BRUNS (Tübingen). Bruns recommends iodoform for the treatment of cold abscess on the ground that the prolonged contact of this agent with tuberculous granulations results in their cure. If a fresh and recently sterilized emulsion of iodoform one part, and olive oil or glycerine 10–20 parts, be injected into the abscess after evacuation of pus and then repeated according to necessity a shrinkage of the abscess results which after 2 months is cured. Over 100 abscesses (cold) were treated upon this plan in the Bruns Clinic and over 80% cured. Of these, 10 cases

were cold abscesses, resulting from caries of the vertebræ. The cure was permanent, so that we may assume the caries was cured. On this account the same treatment is recommended for pleuro-empyæma of tubercular nature. In tubercular joint diseases iodoform also gives brilliant results. If there is capsule fungus of the joint a needle is passed into the fungoid structure at various points, and 2-4-6 ccm. of the emulsion forcibly injected. If there is effusion into the joint, the same is evacuated and enough emulsion is injected to take its place, 10-20-30 gram. Fixation of the joint is necessary only when great pain is present, which, with the iodoform treatment, soon disappears. We can allow the patient (treated in the dispensary) to use his limb carefully. In the parenchymatous injections the procedure may be repeated in 8 days, in joint effusion after 2-4 weeks. We do not expect signs of improvement before the 6-8 week. The joint fungus atrophies and the periarticular abscesses shrink into hard nodules, which become normal tissue after years. Movement of the joint has been retained in part or for the whole in most cases. In old people and severe forms of disease a complete cure does not always result, though the pain becomes less and the swelling diminishes. The usefulness of the joint is thus increased. The results have been uniformly good, as Trendelenburg has shown, in the elbow, knee and ankle-joint.

In the discussion following the above, Heusner (Barmen) said that he had used this method for 4-5 years with good results. Trendelenburg (Bonn) had treated 133 cases with the method, and in at least 68% could the improvement be attributed to the treatment, though cure did not always result. He had used the method, not only in joints and bone, but in tuberculous processes of the soft parts, lymphatics and testis. Eiselsberg (Vienna) said that Billroth (Vienna) has had good results with iodoform glycerine injection by first opening the abscess and extirpating all tubercular tissue and then injecting. The details of this method of Bruns have been fully reviewed in the ANNALS of 1889.—*Beilage zum Centralb. f. Chir.*, 1890, No. 25.

HENRY KOPLIK (New York).

VI. Upon Cardiac Impulse in Relation to Opening the Cranium, the Pleura and the Cavity of the Abdomen. By DR. IGINIO TANSINI (Modena). The author, in his experiments, employed rabbits, laying bare the apex of the heart, which in these animals can be done without disturbing the pleura, and applied the sphygmograph directly thereto, thus producing graphic tracings and indubitable results.

In the matter of the cavity of the cranium, the following questions were sought to be answered:

1. The influence which the employment of the trephine in opening the cranium exercised, as compared with the chisel, in the latter case both with and without the existence of injury.

2. The influence which pressure applied outside the dura, for the purpose of arresting hæmorrhage, exercised, as compared with pressure made directly upon the brain substance.

3. The influence of irrigation, by means of antiseptic solutions, of the lateral ventricles, and of the fourth ventricle.

Based upon 25 experiments, the following conclusions were arrived at:

1. The use of the trephine crown in opening the skull is decidedly less in its influence upon the heart's action than the employment of the chisel. In order, in case of an otherwise uninjured skull, to avoid disturbances of the heart's action in opening the cavity by means of a chisel, the instrument employed must be very small, and held at an inclination of at least 30° to the surface of the skull. In cases of injury to the skull involving an opening of the same, the employment of the chisel does not seem to exercise any disadvantageous influence upon the heart's action.

2. Extra dural tamponing exercises far more disadvantageous influence upon the heart's action than direct pressure upon the brain substance. A venous hæmorrhage may always be arrested by means of the latter without severe disturbance of the heart.

3. Irrigation of the ventricles does not affect the action of the heart, if a free channel for the return of the fluid be provided.

In the matter of the pleura, the author sought to establish the rela-

tion which the one side bears to the other, in regard to the heart disturbance following the opening of the same; the influence of an open pneumothorax; the usual irrigation of the pleural cavities, and the use of a permanent flow of different fluids through the left as compared to the right pleural cavity, at varying temperatures.

Based upon 10 experiments, the following conclusions were reached :

1. Open pneumothorax, upon the right as well as upon the left side, exercises a most decided effect upon the heart's action; primarily, marked disturbances of rythm, and afterward, diminution of the heart-movements occurred.

2. Continuous irrigation of the pleural cavity by means of cold water (11°C.) or warm water (38°C.) disturbs the heart's action most decidedly, retarding the same, and accelerating the death of the animal.

3. The action of different antiseptic agents as such, excluding those which have a poisonous effect, exercise no influence on the heart.

In regard to the influence of opening the peritoneal cavity, the author endeavors to clear up the following :

1. The influence which exposure of loops of intestine to the atmospheric air for different periods of time has upon the heart's action.

2. The effect of contact of the intestines with cloths in which the same may be wrapped, and with sponges wrung out of water at varying degrees of temperature.

3. The effects of irrigating the abdominal cavity with fluid at different temperatures.

The results of 16 experiments, instituted with the view of determining these several points, show, in a general way, that continuous and persistent irritation of the nerves of the abdominal cavity, in either healthy or hyperæmic condition, of the peritoneum, may produce slowing and arrest of the heart.—*Centralb. f. Chirg.*, 1890, No. 24.

GEO. R. FOWLER (Brooklyn).

OPERATIVE SURGERY.

I. A New Osteoplastic Amputation of the Foot (Amputatio Talo-Calcanæa Osteo Plastica). By DR. D. KRANZFELD (Odessa). The operation which is a modification of the method of Hancock, was done on a patient with the following history: Boy, æt. 19 years, was injured on September 12, 1889, by a heavy case falling on his left foot. The whole of the dorsum of the foot was ecchymosed, and in the center there was a large transverse gaping wound with contused edges, occupying the whole width of the foot. The injured part was put in a moist antiseptic dressing; on the third day the whole anterior part of the foot was gangrenous; on the fifth day a line of demarcation formed on the dorsum and soon after on the sole. On the eighth day after the injury the gangrenous soft parts and bones were removed at Lisfranc's joint. The skin was divided on the anterior side about 1 cm. in front of the tibio-dorsal articulation. On the inner side the skin defect reached to 4 cms. above the internal malleolus.

One month after admission the foot was in the position of talipes equinus. Its anterior part presented a bony projection covered by granulations and formed by the anterior tarsal bones. The skin covering on the inner side ended about 4 cms. above the internal malleolus, and externally 2 cms. above the external malleolus; on the sole the skin reached as far as the anterior border of the calcaneum. The case was allowed to granulate for three weeks longer so as to obtain better covering for a stump, and at the end of this time the following were the skin limits, outward and forward 3 cms., and internally 2 cms. in front of the tibio-tarsal articulation.

The choice of operations in this case was either a Pirogoff, or its modifications, or the sub-astragaloid disarticulation of Malgaigne. By the first operation the healthy tibio-tarsal articulation had to be sacrificed, and by the second the healthy calcaneum had to be removed. The writer thought it would be possible to obtain a movable stump with a broad base and with but little shortening by sawing off the under surface of the talus and the upper one of the calcaneus and allowing the fresh surfaces thus obtained to heal together.

On November 23, this operation was carried out as follows: The edges of the skin were freshened, Choparts' joint opened and the scaphoid, cuboid and cuneiform bones removed. On the outer side a horizontal incision was made beginning immediately under the external malleolus, and carried forward in an anterior direction; the capitellum of the astragalus was sawn off, the tarsal sinus entered and the articulation between the calcaneum and astragalus opened. The upper surface of the os calcis was removed in a horizontal direction, and the under surface of the astragalus was likewise treated. After the hæmorrhage had been checked the wound was packed with iodoform gauze, dressed, and the limb placed in an ordinary metallic splint.

On the third day the packing was removed, the sawn surfaces were completely adapted, the calcaneum being pushed slightly forward, and the wound was drained and sutured.

Healing took place nicely; in six weeks everything was firmly consolidated.

Two months after the operation the patient could step on the foot without pain and there was no noticeable shortening of the limb.

The patient can bend the foot at the tibio tarsal articulation. The sole of the foot is flatter and broader than normal.

This operation has several advantages over the Pirogoff, being more conservative and maintaining the normal length of the limb; moreover, in children it has the advantage of not destroying the epiphyseal cartilage at the lower end of the tibia and fibula. The important point to be kept in mind is the slipping forward of the os calcis. —*Centblt. f. Chirg.*, No. 20, 1890.

F. C. HUSON (New York).

ABDOMEN.

I. Laparotomy for Revolver-Shot Wound of the Abdomen. By Dr. MIKHAIL P. VISHNEVSKY (Vladimir on-Kliazma, Russia). An epileptic and weak-minded pupil of an ecclesiastic college, æt. 18 years, of middling make and nutrition, shot himself in the abdomen from a small-sized revolver. When seen on the third day, he was suffering from collapse, with frequent fæcal vomiting, high

fever and general convulsions, the abdomen being intensely distended and extremely tender. Near the navel, on the right side, there was present a dirty, inflamed, small, circular wound, from which since, the seventh day, an incessant flow of a fluid faecal matter issued. No stools occurring for eight days, on the ninth castor-oil (5j) was given internally with satisfactory results. About the 22d day vomiting ceased, the temperature returned to the normal, the stools became regular, abdominal pain disappeared; the wound, however, continued to discharge much pus with a faecal odor. On the 24th, a deep fluctuation in the left iliac fossa could be felt. On the 25th the abdomen was opened by an incision, 6 cm. long, running parallelly to, and 2 inches above, the left Poupartian ligament. A large quantity of pus mixed with faeces escaped from a circumscribed abscess, situated amidst intestinal coils, but no bullet could be found. The cavity was washed out with 1% carbolic acid solution, and supplied with drainage. On the 35th day the bullet, and on the 67th day the surgical, wound soundly healed. On the 79th the lad was discharged in best of health, his bowels acting regularly.—*Khirurgitchesky Vestnik*, March, 1890, p. 174.

II. Case of Traumatic Injury to the Abdominal Wall.

By Dr. M. I. LAKHOVETZKY (Kainsk, Siberia). The author narrates the following rare case: A soldier, æt. 23 years, when getting down from a hayloft, fell on a wooden pitchfork, one of its teeth (2 cm. in diameter) penetrating into the abdominal wall. He at once extracted it and ran home, notwithstanding agonizing pain. Hæmorrhage, however, was but trifling. On examination on the next day, there was found an almost circular hole, of the size of a shilling piece, situated in the upper portion of the anterior aspect of the scrotum on the right side, and leading into a blind pouch, of the size of a walnut. There was present, further, a very tender sausage-like tumor, about 16 cm. long and 5 cm. broad, which commenced just above the pubes on the right side to run obliquely toward the anterior superior iliac space, terminating abruptly in two fingers' breadth from the latter. About the eleventh day the scrotal wound healed; the inguinal swelling, however, gradually enlarged and became fluctuating and partly tympanitic.

An exploratory puncture with a hypodermic syringe revealed the presence of offensive thin greenish pus. Without delay, the abscess was opened by an incision, 8 cm. long, running parallelly to its long axis, and about $1\frac{1}{2}$ sig. glassful of flocky pus with a quantity of gases removed. The cavity proved to be situated entirely between the abdominal muscular layers, no communication with the peritoneal cavity existing. It was thoroughly washed out with a sublimate corrosive solution (1:1000) and plugged with gauze soaked in the same lotion and freely powdered with iodoform, after which an antiseptic dressing was applied. The after-course left nothing to be desired, the wound rapidly healing. Dr. Lakhovezsky comes to the conclusion that the pitchfork's tooth, having pierced the tunica dartos on the right side, passed between the right spermatic cord and the root of the penis through the anterior wall of the sheath of the right rectus abdominis, and then entered into the abdominal muscles on the left side, carrying all along a mass of pyogenic microbes. An almost identical case has been published by Dr. Belaieff (in the *Trans. of the Pirogovian Russian Chirurgical Society* for 1884.)—*Proceedings of the Oouisk (Siberian) Med. Society* for 1889, No. 9, p. 213-221.

III. Laparotomy for Enteroliths. By Dr. STEPAN I. KHALAFOFF (Moscow, Russia). The author relates the following unique case: A poor peasant woman, æt. 50 years, of middling make and nutrition, sought for admission into Count Sheremetieff's Hospital on account of periodic attacks of excruciating pain about the right iliac fossa, recurring once or twice monthly, lasting on each occasion from three to six days, and accompanied by abdominal distention, vomiting and constipation. The attacks had begun to appear about 20 years before the admission, gradually increasing in their frequency and severity, and making her totally incapable of working. During free intervals her bowels had been acting quite regularly. Examination of the abdomen revealed the presence of two hard, smooth, globular tumors, situated one above the other, somewhat downward and to the right from the navel, the upper being as large as an orange, the lower about the size of a hen's egg. The tumor could be freely moved in

vertical and lateral directions, but less so in an antero-posterior one, the manipulations causing agonizing pain. According to the woman's statements, she had noticed the tumors many years before, their size steadily increasing ever since. No definite diagnosis could be arrived at. In view of the fact, however, that the attacks of pain greatly interfered with the patient's earning her daily bread, laparotomy was resolved upon. Accordingly, the abdomen was opened by an oblique incision, commencing just above the right superior anterior iliac spine, and ending in three fingers' breadth from the Poupartian ligament. The omentum being pushed aside, a dilated and congested portion of the ascending colon, containing the tumors, presented itself. It was dragged out from the wound and opened by a longitudinal incision, 4 inches long. The smaller lower foreign body was removed without any difficulty, but the larger upper one could be extracted only after some enlargement of the abdominal and intestinal incision. The portion of the colon was found to be considerably dilated, its walls intensely hypertrophied, the mucous membrane thickened, softened, red-violet, and covered with numerous profusely bleeding polypoid excrescences. Both of the wounds were closed with silk sutures, and an iodoform dressing applied. The after course was most satisfactory, the abdominal wound healing *per primam*. On the 9th day the sutures were removed, and the bowels moved by castor oil. About the 21st day the woman left the hospital in best state. The extracted foreign bodies proved to be very light enteroliths, resembling potatoes in their shape, measuring 6 and $4\frac{1}{2}$ cm. in diameter, and representing a homogenous mass which was found (by Prof. V. A. Tikhomiroff) to consist of a kind of "pressed felt." The latter was made of fine ligneous hairs or fibers of some tree, with admixture of rye and oat barb scales. According to Dr. Khalafoff's theory, the woman had been habitually eating a bad bread, made of flour, mixed with some ligneous substance. At some time, many years ago, she had had, probably, a localized inflammatory process about the colon, accompanied, of course, by more or less profuse secretion of mucus. Some clumps of the inspissated mucus adherent to the intestinal wall formed the nuclei around which insoluble or indigestible ligament cells began to gradually settle down, etc., etc.—*Meditzinskoie Obozrenie*, No. 5, 1890, p. 460.

IV. Laparotomy for Pancreatic Cyst. By Dr. NIKOLAI N. FILIPPOFF (Kharkov, Russia). The author describes a very interesting case of pancreatic cyst treated and cured by abdominal section with drainage. A married peasant woman, æt. 65 years, was admitted to Prof. W. F. Grube's clinic with complaints of abdominal tumor, vomiting after meals, severe pain and dyspnœa, loss of appetite and general weakness. She had been always enjoying good health until 3 years before admission when she had first noticed a slowly increasing lump in the epigastrium. For about 2 years or so the tumor had not caused any particular inconvenience, beyond occasional attacks of sharp abdominal pain, occurring at long intervals, but during the last 6 months the tumor had been growing very rapidly, the pain becoming incessant and being accompanied by dyspnœa and frequent vomiting. On examination, the patient was found to be considerably emaciated, her skin sallow, with a dirty tint, and wrinkled, the sclerotics yellowish, the abdomen much enlarged. The left hypochondrium and the adjoining parts of the epigastric and meso-gastric regions were occupied by a globular, smooth, elastic, fluctuating, but slightly movable tumor, of the size of an adult man's head. On inspirations, it was slightly (1 to 2 fingers' breadth) displaced downward. On percussion, the dull area corresponding to the tumor proved to be distinctly separated by a tympanic zone, both from the liver and spleen, the latter note being also given by the stomach above and intestines below and along the left border. On palpation through the very flabby and thinned abdominal wall the growth was found to extend deep downward or backward. The patient was complaining of pain in the left epigastric region, increasing on movements and vomiting and often occurring in the shape of agonizing paroxysms during which it was shooting to the loins and sacral and spinal regions. The temperature, pulse and urine were normal. A simple pancreatic cyst was diagnosed and laparotomy without delay performed, the abdomen being opened by a median incision commencing 3 fingers' breadth below the tiploid process and measuring 12 centimetres. The anterior wall of the cyst presenting itself in the wound, a large-sized trocar was plunged into it, and a large quantity of an alkaline dark-brown fluid removed. A manual exami-

nation showed that the cyst was growing out from the head and adjacent portion of the body of the pancreas, wedging its way between the stomach and duodenum. It was firmly adherent to the organs as well as to surrounding intestinal coils and the omentum, but no pedicle was present. A total extirpation being impossible, the sac was stitched to the abdominal wall, opened, partially excised, washed out with a 4 per cent solution of boracic acid, and supplied with 2 large drainage tubes, after which an antiseptic dressing was applied. On the 4th day some eczematous rash cropped out around the wound, on the 9th, the evening temperature suddenly rose to 39.2°C., (which depended upon some dietetic error), but on the 11th returned permanently to the standard. On the 18th, the patient was discharged with a minute fistule still remaining, but otherwise in a most satisfactory condition, pain and vomiting having ceased, appetite improved, etc. [This is a second Russian case of laparotomy for pancreatic cyst, the first having been published by Dr. J. Treiberg; *vide* the ANNALS OF SURGERY, November, 1888, p. 389. A case of pancreatic cyst in a lady, æt. 47 years, cured by laparotomy with drainage, has been also communicated by Professor Annandale and Dr. J. Ch. Simpson, of Edinburgh, in the *British Medical Journal*, June 8, 1889, p. 1291. The pancreatic literature appended to the paper is rather incomplete.—*Reporter*]—*Khirurgitchesky Vestnik*, January, 1890, p. 27-34.

V. Spontaneous Rupture of the Rectum with Prolapse of Bowels. By DR. VASILY V. MASIMOFF (St. Petersburg, Russia). The writer relates the following exceedingly rare and interesting case. A working woman, æt. 75 years, who had been suffering from habitual prolapse of the rectum with frequent hæmorrhage and constipation alternately with diarrhœa for 9 years, when straining during defecation suddenly felt acute pain followed by protrusion of bowels from her anus. When seen several hours later, the patient was lying on a sofa in a lithotomy position with an enormous heap of cold, distended and blood-stained intestinal coils hanging down between her thighs from the anus. The pulse was almost filiform and quick, but collapse was only moderate, and the woman "did not complain of any particular

pain." Any operative interference being flatly declined, the author's aid was necessarily limited to washing out the prolapsed intestinal mass (which consisted mainly of the small bowel with its mesentery, but also included a portion of the large one) with a tepid 2% solution of boracic acid, and reducing it portion by portion. The procedure proved rather troublesome and took not less than 40 minutes' time (the length of the prolapsed bowel amounting to 5 feet), but was borne by the woman apparently quite well. The after-treatment consisted of opium internally and rest. She passed the next day fairly quietly, but during the night died (when asleep.) No necropsy was allowed. Discussing the case, Dr. Masimoff points out that 1, international literature contains only 4 cases of spontaneous rupture of the rectum with prolapse of bowels (alone or with omentum). They were published by Professor Adelman (*Journal fuer Chirurgie und Augenheilkunde*, 1845, Vol. II, p. 556); Stein (*Hospitals Meddelelser*, 1853, Vol. VI); Nedham (*Philosoph. Transactions*, 1849, Vol. V); and Brodie (*London Medical and Phys. Journal*, 1827;) 2, the most rational treatment of such cases consists in immediate abdominal section with reducing the bowels and closing the rupture with sutures.—*Voenna Neditzinsky Jurnal*, April, 1890, pp. 191-200.

VALERIUS IDELSON (Berne).

VI. The Treatment of Prolapse of the Rectum. By FREDERICK TREVES, F.R.C.S. (London). The author remarks about the treatment of rectal prolapse by *subcutaneous injections into the ischio-rectal fossa*, that the fluids used consist of solutions of nux vomica, carbolic acid and ergotin—Vidal claiming three cases of cure by the latter, in one of which no less than twenty-two injections were employed. The procedure would appear to be followed by severe pain and spasm of the sphincter and to be uncertain in its results and tedious in its employment. It can scarcely be considered to be founded upon sound scientific principles or to be a measure devoid of reasonable risk, since at least one fatal case of poisoning is reported to have followed the injection of nux vomica.

The application of nitric acid aims at promoting cure by produc-

ing such a cicatrix as will cause complete contraction of the mucous membrane, seeking also to promote adhesion between the coats of the disorganized bowels. Mr. Treves considers this method as little less than barbarous and as representing a survival of an evil period in the surgery of the past. The operation involves extreme pain and is apt to produce extensive sloughing and severe inflammation of the rectum and has been followed by fatal hæmorrhage and by stricture of the lower part of the bowel, while the after-treatment is not infrequently prolonged.

The application of the actual cautery to the mucous membrane of the prolapse or the removal of the linear folds of that membrane by means of the clamp and cautery are measures little superior to that just described. The treatment is painful, a severe degree of inflammation is excited, sloughing is inevitable, the special dangers of a burn are introduced and more or less cicatrization is unavoidable. During the use of the clamp and cautery, the weakened bowel has given way and coils of small intestine have escaped.

Excision of the part substitutes a clean cut for a burnt and gangrenous surface, the operation area is reduced to a minimum, no damaged bowel is left in the pelvis, hæmorrhage may be rendered practically impossible, and the risk of a subsequent stricture can hardly be said to exist. The method is simple and final, it involves no protracted period of after-treatment, it induces but little pain, it leaves a simple wound which is open to inspection and appears to offer the best claims to being considered a method of radical cure.

In case of a sea-captain, æt. 36 years, with a very large prolapse of the "complete form" of four years' standing, Mr. Treves operated by excision. The patient was placed in the lithotomy position and the prolapse drawn down to its full extent. The mucous membrane forming the outer wall of the prolapse was now prepared for separation around the entire base of the cone, the knife traversing the skin close to its line of junction with the membrane. The tunic was then separated from the prolapse by the scissors aided by traction and was everted down to the apex of the cone, exposing the protrusion now quite bared of mucous membrane. It felt hard and firm except at its

anterior part close to the anus. Here there was evidence of a protrusion of peritoneum, the wall of the cone being flacid and very markedly in contrast with the firm wall presented by the rest of the prolapse. No evidence of a hernia of the small intestine existed. He then cut across the prolapse at the level of the anus—the very base of the cone, dividing the anterior wall first and opening the peritoneal cavity, the opening into which was at once plugged with a sponge. The rest of the prolapse was then severed rapidly with the scissors, the cut end of the bowel, muscular and mucous coats together, being seized with pressure forceps as each inch or so was severed; this allowed of the immediate arrest of all bleeding and also prevented the mucous membrane from being withdrawn into the rectum, and held the cut end of the bowel in position. The small plug of sponge having been removed, the peritoneal wound was closed by means of some six or seven points of the finest chromicised cat-gut. The divided ends of the bowel were next attached to the margin of the anus by sutures of silk-worm gut involving the whole thickness of the wall of the rectum. A suture of silk involving merely the skin and the mucous membrane would obviously not have met the needs of the case. As the pressure forceps were removed, to prepare each segment of the divided rectum for fixing in place, any bleeding point, made evident, was ligated.

The bowel had been divided above the greatly thickened and hypertrophied part, which formed the prolapse, and the segment attached to the anus was thin and in every respect normal. The anus, as it appeared at the time of operation, was of immense size. The external sphincter appeared as a quite considerable ring of muscle. The part removed measured five inches in length and upon its anterior surface was nearly three square inches of peritoneum. Although the mucous membrane was represented by a double fold, one covering the outer surface of the prolapse and the other lining its lumen, the muscular tunic was represented by but a single tube. The internal sphincter formed the apex of the protrusion, and thus it happened that four inches and three quarters separated the external sphincter from the internal.

The patient recovered rapidly and without a bad symptom, getting up on the twentieth day and being discharged well in six weeks.

Two other similarly extreme cases are related.—*Lancet*, February 22 and March 1, 1890.

JAMES E. PILCHER (U. S. Army).

EXTREMITIES.

I. On Re-Union of Cut-Off Fingers. By DR. ALEXANDER P. ZATVARNITZKY (Arkhangelsk, Russia.) A boy, æt. 13 years, a saw-mill worker, managed to get his right fore-finger under a saw moving at full speed. Upon examination 4 hours later (during which time the patient had been freely bleeding and subjected to some treatment by pressure with dirty rags), the author found that the nail phalanx was hanging down on a lateral cutaneous bridge, 1 cm. wide, having been cut off through the point. Having thoroughly cleansed the parts with a 0.1% corrosive sublimate lotion and arrested all hæmorrhage, he powdered the wound with iodoform, carefully adjusted the phalanx to the digital stump, stitched them together all round with interrupted sutures, again powdered with iodoform, fixed with strips of adhesive plaster, dressed with hygroscopic cotton wool and gauze, placed the finger on a pasteboard splint, and ultimately applied a narrow roller bandage. On removal of the dressing on the 10th day, the phalanx was found to have soundly re-united. About 4 weeks later the boy resumed his work, the mobility of the digit improving daily. The author also related another case referring to a coachman whose nail phalanx of the left middle finger was broken off through the joint by a horse, only the extensor and flexor tendons remaining intact. The adjacent soft parts were intensely crushed. About three hours after the accident, the same operation as in the former case was performed. In spite of strictest antiseptic precautions, however, no re-union ensued, but serious suppuration developed. To prevent an upward spread of the latter, amputation above the injured joint was ultimately resorted to. Discussing those and similar other cases from his practice, Dr. Zatvarnitzky arrived at the following conclusions concerning the treatment of cut or torn off nail phalanges of fingers.

1. In such cases where there are present severe laceration or crushing of soft parts or comminuted fracture of the bone, no re-union can be expected. Hence it is advisable to resort to a primary amputation of the phalanx without loss of time. 2. In such cases where the injury is of a cutting character and where soft parts are not much crushed, re-union may be still obtained even when several hours have elapsed after the accident. 3. Be, however, a cut-off phalanx already cold and deadly pale, as happens in cases coming late under observation, it is better to remove the part, since its re-union is hardly possible.—*Proceedings of the Arkhangel'sk Medical Society*, 1889, No. 5, p. 15.

VALERIUS IDELSON (Berne).

GENITO-URINARY ORGANS.

I. On the Amputation of the Penis and the Use of Buried Sutures in the Same. By Dr. H. KELLER (Czerny's Heidelberg Clinic). After an historical introduction he considers the three modern methods. That by the galvano cautery and the one by ecraseur are but briefly treated, whilst that by the knife is naturally given the chief space. The special innovation simply refers to the control of oozing and late hæmorrhage, after ligation of the dorsal and profunda and the bulbo-urethra. "Both corpora cavernosa are united by deeply lying transverse catgut sutures in such a way that the two cut surfaces are in apposition and the tunica albuginea of both cavernosa are in contact in front. Then follows second vertical row of stitches drawing together the external skin of penis over the sutured cavernosa-stump. Oozing is thus immediately stopped and only once was there any secondary hæmorrhage—from loosening of a catgut thread. The history of the principal applications of the buried suture is sketched, starting with Steele (1874).

Statistically he uses 18 cases from the last ten years. The patients' ages ranged from 29 to 85 years. In 11 of 15 carcinoma cases phimosis was found as a cause (Demarquay found 42 out of 59 and Kaufmann 28 of 158). Like Travers he observed no case amongst Jews.

In 1 case the growth occurred in a man whose wife had uterine can-

cer (Demarquay notes this in 1 of 134. Bruce in 1; Kaufmann in not one of 158). This disease gives a good prognosis as to relapse, metastasis and generalization, until the inguinal glands become affected. He had 9 relapses in 17 cases. After primary, and in part repeated operation one has remained 9 years free; 1 6; two 3, and five 2 years. A brief history of each case is appended.—*Bruns' Beiträge klin Chirg.*, 1889, Vol. 4, heft ii.

WILLIAM BROWNING (Brooklyn).

II. On the Treatment of Hydrocele by Incision. By DR. CASIMIR I. SMIGRODSKI (St. Petersburg, Russia). The author publishes 14 cases of hydrocele treated after Volkmann's method by himself (3) and Dr. Dombrowski (11) in the Petropavlovsky Hospital during the last 3 years. The patients' ages varied from 10 to 60 (7 being of from 32 to 44), the duration of the affection from 5 months to several years. Of the 14 cases, in 1 hydrocele congenital processus vaginalis existed; in 6 hydrocele testis et funiculi spermatici (4 on the left side, 2 on right); in 5, hydrocele testis (1 left sided, 4 right sided); in 2, hæmatocele (right sided). After incision, the vaginal cavity was washed out with a weak solution of corrosive sublimate, both during the operation and on dressing. In some cases the whole cavity was plugged with iodoform gauze, but, as a rule, only small plugs of the same material, or fine drainage tubes were inserted into the angles of the wound, the remaining part of the incision being closed with marginal and deep sutures. The plugs, or drainage tubes, were removed in a few days, the stitches in from 4 to 10. In a majority of the cases the wound healed *per primam*; in such cases where the cavity's wall was very thick, the second intention was brought about to obtain a complete obliteration of the cavity. Recovery took place, on an average, in 32 days. In 4 cases, the after-course was entirely apyretic; in 5, the temperature rose up to 37.8°C., on the evening after the operation; in 5 it oscillated above 38°C. for the first 2-8 days. As a rule, some swelling of the left testis operated upon was observed. In 1 case a subcutaneous abscess developed in the neighborhood of the wound and was emptied by incision. In every one and all cure was

obtained. The author's general conclusion is to the effect that Volkmann's method gives fully satisfactory results, is entirely safe, and may be practiced in patients of "almost all ages".—*Bolnitchnaia Gazeta*, *Bolkinsa* No. 12, 1890, p. 274.

III. Case of Gunshot Wound of the Bladder and Rectum; Recovery. By DR. MIKHAIL M. VELITCHKIN (Askhabad, Transcaspian Russia). The author details the following rare, if not unique, case: A middle aged Persian thief, when trying to run away from a policeman, was shot from a rifle and fell down, bathing in blood, the bullet piercing his body through and through. On examination, 11 hours later, the hypogastric region was found to be somewhat distended and very tender, the iliac ones dark red. The entrance wound was situated in the left buttock, corresponding to the sciatic notch, the rectum being perforated about 7 cm. above the anus. The exit wound occupied the dorsal aspect of the penis close to its root; it was irregular, gaping, with jagged and everted edges, and could freely admit a forefinger which penetrated into the bladder. From both of the orifices there was oozing out urine united with fæcal matter, not a drop passing through the urethra. The penis was covered with dark-brown bullæ. For about 12 days the patient was rather weak and had fever (up to 39.6°C) with profuse diarrhoea, but later on a steady general improvement set in. On the 24th day, the entrance orifice soundly healed; on the 29th, the posterior wound of the bladder (since the urine ceased to contain fæces); on the 58th, the urine began to normally flow from the urethra; on the 74th, the exit wound completely closed; on the 85th, the patient was discharged quite well. The treatment consisted in washing out the wounds with a 0.1% solution of corrosive sublimate, alternately with a 3% boracic acid lotion and a 2% salicylic acid 1; in the beginning opium, valerian, Hoffmann's tincture and brandy were administered internally; later on, catheterization was resorted to. The patient made all possible efforts to prevent healing of his lesions, since he feared that after his discharge from the hospital, he might be punished by hanging.—*Russkaa Meditsinia*, No. 3, 1890, p. 39.

VALERIUS IDELSON (Berne).

IV. Experimental Studies in the Surgery of the Kidneys. By TUFFIER (Paris). The experimental studies of the author, exclusively made on dogs, concern the four major operations, which, at the present, are chiefly performed on the kidney: nephrectomy, nephrorraphy, nephrotomy, and urethrotomy. By several operations following each other Tuffier removed first the right kidney, then through several times repeated partial sub-capsular resection the left kidney. He found that a nearly complete cessation of the excretion of urine and urea followed every nephrectomy, which, however, never lasted more than 24 hours. After six days the equilibrium is again established, and the more quickly so the less of the parenchyma of the kidney has been removed. The suppression of the secretion of urine the author declares to be reflex, as the remaining capsule has been found to be in a healthy state.

From his experiments Tuffier draws the conclusion that pro kilogramme animal (approximately) 1.0 to 1.5 grammes secreting renal parenchyma are required on an average. In this approximation the subcutaneous fatty tissue is not included, which is regarded as "dead weight" by Tuffier. If we estimate the average weight of person at 70 kilogrammes, then he requires 80 to 100 grammes kidney, *i.e.*, only a third or one-fourth of that which he actually possesses. The animals which were used in the experiments, died, not from uræmia in consequence of these successive nephrectomies, as one would be led to believe. The remaining part of the kidney-structure continued to perform its function, as could be seen from the urine contained in the bladder. The animals die, after 24 to 36 hours, in profound collapse, similar to that which is described as traumatic shock following operations. The compensation takes place in part by actual hypertrophy of the renal parenchyma; in part by new formation of glomeruli.

It results practically from these experiments that nephrectomy is tolerated without any danger if the second kidney be in a healthy state. Information about its functional ability may be obtained by estimating the amount of urea secreted by it. Regarding nephrorraphy Tuffier prefers it to nephrectomy in all cases of floating kidney. The cause of the so frequent failure in nephrorrhaphy he recognizes in the

weakness of the cicatrix and proposes two new methods in order to obtain a more resistant cicatrix. One of these methods has already been employed twice in the human subject. The obstacle for a good fixation is offered by the capsule, which he advises to destroy in order to get a solid adhesion.

Further on the author treats of the surgical invasions and contusions of the kidneys, the *prima intentio* in suture of the kidney, the cicatrices after the nephrectomy, etc., referring very frequently to the works of French and English authors. In the next chapter he speaks of experimental investigations, why wounds of the kidneys do not suppurate and do not become infiltrated with urine, with important experiments on the toxicity of urine. From Chapter IV. follows that aseptic foreign bodies may lodge in the kidney without causing any damage. The next chapter treats of urethrotomy, the direction in incising the ureter, the difficulty in the union of horizontal wounds of it and the application of these phenomena to the treatment of urethral calculi. Numerous illustrations accompany the descriptions of the author. (G. Steinheil, Paris. 1889. pp. 166. *Centralblatt für Gynäkolog.*, 3, 1890.)

V. A Case of Extirpation of the Kidney in a Child, æt. 3 Years. By PROF. DOHRN (Königsberg). Extirpation of the kidney in children belongs to the rarest occurrences, and therefore the following case operated upon by the author is of interest.

The patient, a girl, æt. 3 years. A tumor had developed, since 10 weeks, in the right abdominal region. The child comes from a healthy family, and is otherwise normally developed. She never complained of any pain; appetite, urination and defecation normal; no œdema is noticeable; the thoracic viscera are perfectly normal; the urine is slightly albuminous; the microscope reveals no casts.

In the right abdominal region a tumor of the size of a child's head could be made out, which extended above up to the edge of the last rib and below rested upon the wing of the right ilium, anteriorly passing with its left edge 2 cm. beyond the median line. Behind it extended to within one inch distance to the spinal column. From below

it could be lifted to such a degree from the pelvis that a connection with the pelvic genitals could be excluded. The surface was felt to be wave like, uneven. The abdominal wall was perfectly movable over the tumor. The inguinal glands were not swollen.

A rapidly growing neoplasm of the right kidney was diagnosticated and only by laparotomy was it possible to save the child's life. An abdominal incision was made, beginning at the umbilicus and carrying it down to the right superior anterior spine of the ilium. The incision occupied the external edge of the musculus rectus and was 8 cm. long. After the abdominal wall had been split the tumor, which was of a grayish color and covered by the peritoneum and colon, bulged out. Hoping to remove it without interfering more closely with the abdominal organs, Dohrn sutured the peritoneal covering of the tumor to the peritoneum of the wound before he split the tumor. He could not, however, preserve this exclusion of the abdominal cavity in the course of the operation. Many adhesions, which were difficult to break up, were present. The ureter and the large vessels could be easily ligated. After the removal of the tumor and careful cleansing of the wound cavity, the abdominal cavity was closed by button sutures of silk and an iodoform gauze dressing applied. The healing process took its course without fever. In the 4th week after the operation the patient was discharged; she is now, over two months after the operation, perfectly well.

The macroscopic and microscopic examination of the tumor was made by Prof. Nauwerck. It proved to be a small celled sarcoma.

Dohrn thinks that such tumors will have to be classed in accordance with Cohnheim's views, amongst teratomata, and their origin may be sought for in foetal life.

Extirpations of such tumors in children belong to the most recent time. Fischer (*Deutsche Zeitschrift für Chir.*, 1889, Bd. xxix.) tabulated 25 such cases with a mortality of 48%. To these cases Schede (Experiences on Extirpations of the Kidney), Czerny (*Arch. für Kinderheilkunde*, 1890, 4), Roberts (*Schmidt Jahrb.*, 1889, Heft 11) added others. Including Dohrn's case the recent literature contains 29

cases with a mortality (due to the operation) of 44.9%.—*Centralblatt für Gynakol.*, 16, 1890.

F. II. PRITCHARD (Boston).

VI. The Question of Partial Extirpation of the Kidney. By DR. KÜMMEL (Hamburg). Kümmel refers to Tuffier's experiments upon lower animals, who determined that the percentage of functionally perfect kidney structure required in each animal corresponded to the proportion of 1 to 1,000 or, at the least, 1 to 2,000. Estimating thus, Kümmel shows that the human body is provided with a much larger proportion of kidney structure, and that from $\frac{1}{3}$ to $\frac{1}{2}$ less than that which is now provided would be sufficient. Partial extirpation is, therefore, considered justifiable in certain conditions (abscess of the kidney, when not too extensive, injuries and circumscribed new formations). Reference is made to a case in which, following extirpation of one kidney a portion of the remaining organ was finally sacrificed. A case is also quoted from the last Congress of Naturalists, at Heidelberg, by Herczel, of Czerny's Clinic, in which, following an injury, a swelling appeared in the lumbar region, which proved upon incision to be the kidney with its pelvis filled with a thin gruel-like material. This was emptied and diseased and broken-down portions of the kidney structure removed. Recovery followed. Two cases of partial extirpation are reported in full by the author. Of them the first occurred in a heretofore strong and healthy woman, who had recently decreased markedly in weight, and in whose right side, beneath the ribs appeared a swelling the size of a fist, not painful upon pressure. Upon incision the organ was found to be $1\frac{1}{2}$ times its normal size and in its substance there was found to be embedded a calculus the size of an English walnut, the kidney itself being occupied by several suppurating cavities. The calculus was removed and the walls of the abscesses removed by dissection so as to leave but one large cavity, more than one-third of the kidney structure being thus sacrificed and the cavity tamponed with iodoform gauze. The patient left the bed on the third day, healing took place rapidly, and a noticeable feature of the case was the fact that not a single drop of urine ever

came from the wound in the loin; the ureter carrying off the secretion from the first. In the second case, a man, æt. 58 years, the author extirpated the upper convex portion of the kidney for a diseased condition of the organ. In this case likewise, no urine escaped by the wound the patient bore the operation remarkably well, no disturbance of the renal function following.

A practical point is suggested by the author in connection with these two cases. From the well-known fact that wounds of the pelvis heal but very slowly, urinary fistulæ frequently following, he suggests, in view of his very favorable experience, that the best result to the pelvis in exploring for renal calculi is through the kidney structure itself, rather than incision into the pelvis of that organ. This suggestion has already been made by Israel, according to Kummel.—*Centblatt f. Chirg.*, 1890, No. 18.

VII. Contribution to the Study of Inguinal Cystocele.

By Drs. MONOD AND DELAGENIERE. Three cases of this condition are given *in extenso*, but which briefly stated are as follows: The first patient, æt. 43 years, was the subject of a left-sided hernia; strangulation; operation on the second day. Besides the ordinary contents of a hernial sac, there was found a portion of the bladder situated in front of the latter, covered in a mass of lipomatous tissue, and free from peritoneum. The bladder was accidentally opened during the operation, and immediately sutured. Recovery followed. The second case occurred in a patient, æt. 44 years, with a small, left-sided, irreducible hernia, painful but not strangulated. Diagnosis of omental hernia made. At the operation a small empty hernial sac was found; below and to the inner side of this there was found a mass of lipoma, and behind this a portion of the bladder, which during the operation was unintentionally opened. Suture of the bladder and return of the same. Recovery. The third case occurred in a patient, æt. 53 years, who also suffered from left-sided hernia. In spite of wearing a truss considerable pain followed in an hour after each meal unless the recumbent posture was assumed. Usually, at the end of urination a few drops of blood were noticed. The hernia was irreducible, solid, and

the course of the spermatic cord could be followed, stretched over the tumor. Injection into the bladder failed to increase the size of the hernia, but overstretching of the viscus produced pain in the inguinal region. During the operation the bladder was shown to be free from peritoneal covering, but was attached by means of lipomatous masses to the inguinal canal. The adhesions were loosened and the bladder reduced. At first an afebrile course followed; later on, moderate supuration. The patient died on the 13th day from a pulmonary affection.

It will be noticed that these cases possess this in common, that masses of lipoma were found overlying the bladder wall. It is suggested that the original condition consisted in a lipoma of the lower wall of the bladder, having no peritoneal covering, which by constant pressure crowds into the inguinal, partly by the dragging influence of the mass, and partly by the pressure from behind. Although at first free from peritoneal investment, it may be readily imagined that a persistence of this combined pushing and dragging influence must necessarily result in a projection of portions of the bladder into the canal which shall carry peritoneum along, and thus form a sac in which herniated portions of the intestinal canal may find entrance. The passage of that portion of the bladder wall covered by peritoneum into the canal as a primary occurrence, is considered by the author as out of the question.

The diagnosis of inguinal cystocele is attended with difficulty. The occurrence of decided pain in the neighborhood of the hernia, upon distending the bladder, should be looked upon with suspicion. In the last case this was well marked. An increase in size of the herniated portion of the bladder wall will only occur exceptionally. In all cases in which during an operation for hernia, lipomatous masses are found lying in the canal, the condition should be suspected and measures taken to guard against some of the disagreeable accidents which may follow an accidental wounding of the bladder. Should such be found to be present, the operator should not only free and replace the bladder, but should likewise aim to guard against the recurrence of the cystocele by a removal of the lipomatous masses themselves, even

though this involve opening the bladder and excision of a portion of its wall. In the after treatment, irrigation of the bladder is unnecessary, but the latter should be emptied at least twice a day by means of the catheter—*Revue de Chirg.*, 1889, No. 9.

GEORGE R. FOWLER (Brooklyn).

TUMORS.

I. A Case of Actinomycosis. By V. ITERSON and SIEGEN-BECK VAN HENKELOM. The patient, a woman, æt. 45 years, had always been well up to the appearance of this trouble. She complained of pain in the right side of the abdomen. On inspection of the abdomen a tumor extending upward from the symphysis pubis and the right Poupert's ligament was seen. A certain diagnosis could not be made, and the patient was treated expectantly. Ten days later there was fever. The tumor became larger, very painful, adherent to the skin, and fluctuating. An incision was made, whereupon a quantity of thick pus was evacuated; the finger could be pushed into a cavity with thick walls. This cavity was cleansed with a solution of corrosive sublimate (1:1,000). Microscopic examination of an excised piece of the wall of the cavity showed that although a sarcoma was not to be excluded, an inflammatory infiltration was more probably present. The indurated swelling of the margins extended more and more. This was followed by progressive infiltration, with the formation of abscesses, spontaneous absorption taking place at one place and extension of the process at another. A fistula was present, with weak granulations, while the lymphatic glands were free. Actinomycosis-granules were never discovered. The large affected piece of skin was extirpated and the floor of the cavity curetted. Recovery took place. Microscopic examination revealed only very few of the characteristic granules, while complete myceliæ were found in the tissues, and pus, which could be easily recognized by Gram's method.—*Nederl. Weekbl.*, I, 12, 1889.

F. H. PRITCHARD (Boston).

II. Congenital Sacro-Coccygeal Tumor. By Dr. MIKAIL P. IAKOVLEFF (Tambov, Russia). A well-nourished and normally de-

veloped peasant girl, æt. 3 months, was brought to the author on account of a rapidly growing congenital tumor, situated in the sacro-coccygeal region. The tumor had the size of a male fist (while at first it had not been larger than a nut), and was slightly movable, irregularly shaped, knotty, partly fluctuating, partly soft or dense, and covered with partially adherent tense skin, traversed by numerous dilated veins. A finger introduced into the rectum detected a circular hole in the sacrum (3 cm. above the anus), through which the base of the tumor could be easily reached. On removal of the growth, a portion of the latter was found to be embedded in the pelvic cavity, the remaining mass lying on the lumbo-dorsal fascia between the attachments of the great gluteal muscles. Only the extra-pelvic portion was excised, the operation being on the whole easy, hæmorrhage but trifling. The wound speedily healed without any complications. On examination the tumor proved to be enclosed with a dense fibrous capsule and to contain numberless cysts, varying in size from a millet seed to a cherry, and filled, some with a transparent fluid, some with a turbid thickly matter. Under the microscope the cysts were found to be lined with endothelium. Peripheral strata of the stroma were made of young connective tissue abounding in cellular elements, while central layers consisted of connective and mucous tissues, fatty lobules and bundles of striated and non-striated muscle fibres, all the elements being intermixed in a chaotic disorder. According to Dr. Iakovleff's theory, the tumor represented a teratoma or a rudimentary "parasitic" foetus. Prof. Theodor I. Klein, the distinguished pathologist of Moscow, however, is inclined to think that the author had to deal with a rare case of rhabdomyoma.—*Proceedings of the Tambov Medical Society*, No. 2, 1890, p. 27.

VALERIUS IDELSON (Berne).

BONES, JOINTS, ORTHOPÆDIC.

I. Spina Bifida. By Dr. DERUYTER. This is a study of the indications for interference in cases of this distressing and usually hopeless congenital condition. During the last two years 25 cases have been presented at the Berlin University clinic (von Bergmann). The division of

Recklinghausen is followed, *i. e.*, meningocele, meningomyelocele and myelocystocele. The first contains only cerebro-spinal fluid and communicates with the spinal canal; the second contains, in addition to the cerebro-spinal fluid, some of the essential elements of the nerve centres, while the third variety consists of a cyst the walls of which are made up of the structures of the cord itself, the cavity being filled with cerebro-spinal fluid.

The first of these (meningocele) is operable as a rule, and interference is here advised. The danger of septic infection is considerable, but not insurmountable. It is to be borne in mind that patients who are refused operation under these circumstances are in constant danger of lighting up a meningitis, originating at the point of meningocele.

Cases of the above form are of great infrequency; not so, however, the second (meningomyelocele). In cases of this variety of the affection, those only are operable where the proportion of the essential elements of the cord involved in the cyst wall is small, and derived from a point below the sacral plexus. All cases are to be excluded from operative interference in which the nerves given off from the spinal cord lying in the median line pass to the cyst wall, and thence to the intervertebral foramina.

The third variety, that of myelocystocele, is to be excluded from the question of operative interference altogether, according to Ruyter. This depends not so much upon the fact that fears are to be entertained regarding the danger arising from removal of small portions of the cord itself in extirpating portions of the sac; nor those due to infection, but the author's reasons for not interfering in this class of cases arise rather from the fact that, as a rule, these cysts are small, the skin is sound, and it is believed that the patient's condition is but slightly improved by the operation.

The following points relating to diagnosis are to be particularly noted: Meningocele and meningomyelocele always occur in the median line. The first is possessed of a well-marked and symmetrical translucency, as shown by transmitted electric light. It is generally situated higher up on the vertebral column than the latter, and the bony defect, in all cases reported, is closed below the tumor. In men-

ingomyelocele, certain skin defects are apt to be present, with vascular area and an umblicated appearance. Transmitted electric light shows duplications or folds in the sac, which mark the site of nerve structures involved. The bony defect is not closed immediately below the lower margin of the tumor in this variety, but is continued to the coccyx. A distinguishing and characteristic feature of myelocystocele relates to the fact that it is always and invariably situated laterally. According to von Recklinghausen, extrophy of the bladder, intestinal fissure, genital fissure, and other arrests of development, are common in this form of spina bifida; a case reported by the author, however, proved in other respects to be quite normal.

In doubtful cases, puncture or an explorative incision is considered justifiable for diagnostic purposes. This will be needed in the majority of cases. If it be found that the case is one of the operable variety, the incision, which should always be made at the lower margin of the tumor, and involves the skin only, is continued to the extent of freeing the cyst from its underlying attachments. The pedicle is freed as well, and a provisional elastic ligature applied, the sac incised and accurately sutured beyond the ligature, the latter loosened and the skin united.

Of the 25 cases upon which this study is based, 8 were considered operable in a radical manner. Of these, 5 died. Of the remaining number, 12 perished either from causes referable to their weakened condition at birth, to the effects of the spina bifida itself (meningitis, etc.), or to subsequent complications (pleuritis, etc.). Of those operated upon, death took place apparently from pure asthenia, in most of the cases; a persistent flow of cerebro-spinal fluid was present in all the fatal cases. This, being non-coagulable, will not be arrested by simple pressure, and it is suggested that buried sutures or the application of a Lembert suture would be effectual in overcoming this, the most disagreeable feature of the operative treatment of spina bifida.

In cases in which there is present a narrow pedicle to the tumor, there is always a temptation to ligate the entire protrusion *en masse*; the author prefers, however, to dissect away the coverings of the sac, and open the same as above described.

The inoperable cases are to be treated by aspiration after careful disinfection and the application of ointments in cases in which ulceration has already taken place. Pressure should be carefully avoided.—*Arch. f. Chirg.*, 1890, Bd. XL. Heft. 1.

GEORGE R. FOWLER (Brooklyn).

II. Acute Osteomyelitis in Adults. By T. V. POPOFF (Moscow, Russia). The writer describes 4 cases of acute osteomyelitis in adults which came under his observation in Professor V. I. Kuzmin's clinic; of these 3 ending in recovery, 1 in death. He arrives at the following conclusions: (1) Contrary to Hoffmann's and Berger's assertions, acute idiopathic osteomyelitis occurs not only in children, but also in adults. (2) Most commonly it attacks the diaphysis in the region of the nutrient artery. (3) The latter circumstance naturally suggests that the pathogenic agent penetrates into the bone through the vessel. (4) The disease is caused by the same pathogenic microbes as in children. (5) The course and issue are very much like those in children.—*Pratch*, No. 2, 1890, p. 45.

III. Ignipuncture in Affections of Joints and Bones. By DR. MIKHAIL I. FENSTER (St. Petersburg, Russia). The author contributes a valuable monograph on this important subject, based on 12 cases of his own and on the study of cases published by Kolomnin (153), Trolanoff (31), Prof. Th. Korber (19), Trapenard (17), Juillard (11), Randone Francesca (10), Triboul (4), Albert, Bonnet, Boutineau, Billroth, Bouchacourt, Brun, Burgez, Malot, Charvot, Cornaz, Duploux, Dumas, Estor, Forestier, Guillaud, Gruenberg, Guerin, Hoffa, Imbert Delonnes, Lagout, Prof. Lister, Mennehaus, Morel, Notta, Ch. Nelaton, Ollier, Percy, Phillipeau, Paquelin, Richet, Sedillot, and Vincent. The following are the main propositions brought forward by Dr. Fenster: (1) The chief effects of ignipuncture are these: *a.* it acts as a more or less powerful revulsive; *b.* it relieves pain, which is, probably, dependent upon its lowering the intraosseous tension; *c.* it promotes cicatrization of soft tissues and sclerosis of bone and *eo ipso* brings about subsidence of tumefaction of periarticular and periosseous soft tissues and—to a certain extent—of the joint or bone itself; *d.*

it destroys a certain amount of diseased tissues and pathogenic microbes present therein. (2) Ignipuncture gives best results, *a.* in such cases of more or less recent granulating or fungating articular inflammations (of from 1 to 12 months' standing) in which the morbid process has started from the epiphysis, has a traumatic origin (has been caused by contusion, distortion, etc.) and is not accompanied by clinically distinct suppuration; *b.* in cases of chronic primary osteomyelitis of epiphyses of long bones without any serious implication of the joint. In such cases ignipuncture may often prevent spreading of the process to the adjacent joint, and even may cut short an incipient fungous inflammation of the latter, *c.* in cases of rarefying osteitis attacking short bones, especially of the foot in children. (3) The procedure is further indicated, though its curative effects here are less constant and less pronounced, *a.* in obstinate and inveterate cases of granulating inflammation of joints (of many years' standing); *b.* in such cases where the morbid process has started from, and is mainly localized in, the articular capsule (the so-called "primary synovial" variety) and runs its course without marked suppuration. (4) Less apparent are beneficial effects of ignipuncture in *a.* cases of granular arthritis complicated by suppuration and ulceration of integuments, either by fistules leading into the articular cavity or bone, or by periarticular abscesses in soft tissues without any communication with the joint). Still, the procedure may be sometimes resorted to with advantage, even in such cases, but only as an adjunct to more radical measures (such as opening the joint, *evidement* of tubercular foci, etc.); *b.* in ostitis pelvica (even without fistules). (5) The value of Francesca's recommendation to practice ignipuncture in cases of hyarthros remains yet to be determined. (6) Technically, the operation is very simple, but should be always performed under all antiseptic precautions and, when possible, under chloroform. The best instrument for the purpose is Paquelin's thermocautery (platinum armatura). The operative field should be previously cleanly shaven, the whole limb washed out with water and soap (by means of a brush), then irrigated with a 0.1% solution of corrosive sublimate, and covered with a piece of iodoform gauze soaked in the same lotion, the compress being removed just before the opera-

tion. Each puncture as soon as it has been made should be covered with a moist aseptic pellet. The operation over, the punctures are powdered with fine iodoform, the whole region operated upon covered with fine iodoform gauze and a thick layer of corrosive sublimate cotton wool, the whole fixed with a soft muslin roller, and the limb placed in splints and suspended. Most of the punctures heal (without any complications) between a 14th and 20th day. The number of punctures necessarily varies according to the peculiarities of the case. Thus, in such cases where the morbid process is localized in the spongy substance of the epiphysis (*e. g.*, of a malleolus of the tibia or fibula or a condyle of the femur), 2 or 3 punctures are usually sufficient for all purposes. In coxitis, a single deep puncture into the neck of the femur (after trephining and drilling the major trochanter) is, as a rule, required. In cases of an extensive lesion involving an entire joint or both of the epiphyses, multiple punctures should be made, in 2 or 3 cm. one from another. The size of the puncture is determined by most tender or painful points. In a vast majority of cases, a single sitting is sufficient; in some, however, the operation should be repeated once or twice. [As far as Russia is concerned, ignipuncture as a method for treating diseases of joints and bones has been introduced by the late Prof. S. P. Kolomnin in 1880. One of his papers on the subject may be found in the *London Medical Record*, Jan. 1883, p. 30; another in the *Transactions of the First General Meeting of Russian Medical Men* in 1888. Dr. Troganoff's cases have been published in the *Obukhovsky Hospital Reports for 1887.—Reporter.*]—*St. Petersburg Inaugural Dissertation*, 1890, No. 37, p. 135.

IV. On Reducing Dislocations of the Shoulder After Neil Macleod's Method. By DR. LEONTY G. VASILIEFF (Poltavia, Russia). The author, who has been the first to introduce Neil Macleod's method in Russia (*vide* the *Sei-j-kwai Medical Journal*, July, 1889, p. 178), details 33 cases of luxations of the humerus treated by the right-angle traction, of which 22 are from his own practice, 5 have been communicated to him by Dr. Peter N. Andriosheff, of Lokuvitzza,

and the remaining 6 have been published by Drs. S. S. Preobrajensky, of Moscow (*l. c.*, p. 179), I. I. Denisoff, of Nirgorod (*ib.*), Khokhloff, Deloff, and Alexeeff. Of the 33 cases, in 20 (19 recent subglenoid, 1 intracoracoid) the method proved successful, while in the other 13 (6 recent subcoracoid; 1 recent intracoracoid, 3 old subglenoid, 1 recent "semi-axillary") utterly failed to effect the reduction. In 5 of the latter category (4 subcoracoid, 1 "semi-axillary") Kocher's method was subsequently resorted to with best results. The author arrived at the conclusion that: (1) Neil Macleod's traction is indicated, and should be preferred to all other methods, in recent cases of the subglenoid dislocation; (2) in subcoracoid and intracoracoid luxations it commonly fails; (3) in recent subcoracoid cases, Kocher's method (*vide* the ANNALS OF SURGERY, November, 1889, p. 391) should be invariably practiced; (4) in inveterate and posterior dislocations, neither Macleod's nor Kocher's methods are applicable. [In the *Meditzinskoie Obozrenie*, No. 22, 1888, p. 914 (*vide* also the *Lei-J-Kwai Med. Jour., l. c.*), Dr. A. B. Helbras, of Tasenki, adduces a case of recent subcoracoid dislocation rapidly reduced by Macleod's traction.—*Rep.*] —*Meditzinskoie Obozrenie*, No. 5, 1890, p. 473.

VALERIUS IDELSON (Berne).

V. On Reducing Dislocations of the Humerus after Neil Macleod's Method. By DR. VICTOR F. KRIEGER (Stanitza Kavkazskaia, Caucasian Russia.) The author furnishes details of 2 cases in which he resorted to Macleod's method with brilliant success. I. A Cossack woman, æt. 54 years, received a subcoracoid luxation of the right humerus (fell on the abducted hand from a ladder) and for three subsequent days was subjected to as rough as vain attempts at reduction by her neighbor (who tied her to a post and dragged the extremity, etc.), which manipulations caused enormous ecchymoses and left severe pain. On the fourth day the rectangular traction (amounting to 15 or 20 pounds) was made by the author, the reduction (totally painless) being effected in 15 or 20 seconds. II. A robust muscular Cossack, æt. 27 years, contracted an axillary dislocation of the left humerus (had fallen down from a horse during a race), accompanied

by agonizing pain. Two hours later, the rectangular traction (20 or 25 pounds) was performed, the head of the bone returning to its place in ten or fifteen seconds; the manipulations caused some pain. Dr. Krieger strongly recommends to try the method in all cases of the dislocation, since, 1, the procedure is exceedingly simple and easy, and, 2, does not require any assistants or anæsthetics.—*Meditzinskoie Obozrenie*, No. 5, 1890, p. 478.

VALERIUS IDELSON (Berne).

VI. On the Operative Treatment of Irreducible Traumatic Dislocations of the Shoulder-Joint. By DR. O. KNAPP (Stuttgart). Although this condition is far less frequent than formerly, its operative relief—owing to modern wound-treatment—is more often practiced. This may consist either of arthrotomy with subsequent reduction, *i. e.*, bloody reposition, or of resection of the dislocated head of the humerus. In fresh cases a separated portion from the edge of the glenoid cavity or the tubercle may become interposed. In old cases the tubercula, owing to traction of muscles attached, have often become displaced towards the joint cavity and there adherent. Other impediments to reduction and the various views regarding attempts at simple reduction of neglected dislocations are also considered.

The operative methods by subcutaneous section of the retaining soft parts or by subcutaneous osteotomy of the humeral neck (Mears, 1877) though they have on occasion yielded good results, are, he protests, not worthy of general acceptance. Arthrotomy with subsequent reduction was first practiced by Wattmann of Innsbruck, in 1820. Later cases begin with the year 1874. Although Thiersch, Annandale and Langenbeck were each unsuccessful by this method and had to resort to immediate resection he has collected 10 other cases to which he adds 2 new ones from Bruns. In one of the latter ($3\frac{1}{2}$ months after dislocation) arthrotomy did not suffice and resection was performed later; in the other (2 years old dislocation) the joint was destroyed by subsequent suppuration. Of the whole 12 cases 2 ended fatally—one from delirium tremens, the other from suppuration. Of the remaining 10 the result was, in 1 a pseudarthrosis in the surgical neck, in 3

necrosis of head of humerus necessitating its subsequent extraction, in 4 material improvement of function, whilst in 2 the later reports were incomplete. In these cases the luxation had existed from 2 to 24 months.

Of operations entirely by the other method, that of resection of the shoulder joint, he has collected reports of 20 cases. Of these, 4 were fatal and hence are to be excluded in any comparison of operative results. Of the remaining 16, the later reports were inadequate in 6, leaving 10 cases in which the results were in part equal to those by arthrotomy, in part decidedly better.

In view of various considerations bearing on the question and in harmony with some previous views, he concludes that it will be advisable to attempt the bloody reposition only in fresh irreducible dislocations of the shoulder, but in neglected cases to proceed to resection of the head of the humerus.—*Brun's Beiträge f. klin. Chirg.*, 1889, bd. iv, hft. 2.

WM BROWNING (Brooklyn).

VII. Internal Derangements of the Knee-Joint. By DR. CARL LAUENSTEIN (Hamburg). A sailor, æt. 51 years, had, during the past eight years, suffered from time to time from attacks of pain and swelling in the right knee-joint, feeling as if something was locked in between the joint surfaces. No definite cause for the first attack was ever given. The attacks were accomplished by impossibility to straighten the knee and were usually caused by massage or by forcible flexion.

Dr. Lauenstein saw the patient for the first time June 17, 1889. On the previous day he had had one of these attacks, and was lying in bed with the knee bent at an obtuse angle and with total inability of extending it. The knee joint was extremely painful but there was no effusion and no external deformity. One spot on its inner side, near the head of the tibia, was extremely tender on pressure. On the ground that the most probable cause was a floating body caught between the joint surfaces, the joint was opened on the inner side by a large longitudinal incision and the finger introduced in the wound found the an-

terior part of the joint empty; as the knee was more flexed and the edges of the wound drawn apart, an abnormal growth was seen between the head of the tibia and the condyle of the femur. This growth was seized with forceps and proved to be the dislocated internal semilunar cartilage, which had got pinched in between the articular surfaces. This cartilage was pulled forward and removed, its attachment being cut with scissors.

The wound in the capsule was closed with a continuous catgut suture and the same for the skin. The healing was perfect and the knee retained all its motion, though on account of pain and stiffness a three weeks massage cure had to be undergone.

A case similar to the above has been reported by Allingham in the *Lancet*, for February, 1889, but in this case the cartilage could be felt externally. After removal of the dislocated cartilage a perfectly useful joint remained.

A man, æt. 40 years, formerly a seaman, suffered for ten years from symptoms of a floating cartilage in the knee-joint. On May 13, 1889, the patient had suffered for two days from symptoms showing that it was caught between the articular surfaces. The body (or mouse as it is called in German) could be felt at the outer border of the patella; it was removed by an external longitudinal incision and was $2\frac{1}{2}$ ctm. long by 1 ctm. wide, and was a piece of the miniscus covered by a smooth bony deposit.

The patient made a perfect recovery, all the pain and trouble disappearing after the operation.

A differential diagnosis between internal derangement or dislocation of the miniscus and a floating cartilage is next to impossible.--*Deutsche Med. Woch.*, No. 9, 1890.

VIII. Perforation of the Upper Portion of the Joint Capsule in Fractures of the Patella. By PROF. RIEDEL (Jena.) In his article on the treatment of transverse fractures of the patella Masing expresses his astonishment that after the use of elastic compression the bloody effusion into the knee joint is rapidly reabsorbed, so that often after 24 hours the fragments can be brought into

contact, and certainly, he says, the strong elastic compression of the dressing has helped to bring about the result. Probably it is the cause but it is very doubtful that a resorption of the effused blood should take place in such a short time; this disappearance of the hæmarthrosis can be explained in another way, namely, by rupture of the superior recess of the joint, an occurrence which can take place without the application of compression, and which may easily be brought about by the latter cause. That, in certain cases of fracture of the patella, the superior pocket of the joint gives way without any elastic compression being used, is proven; the only question is, is this occurrence sufficiently frequent to be of any clinical significance.

A laborer, æt. 59 years, on jumping from a wagon in November, 1888, fell and fractured his patella; he was taken home and a large swelling of the right knee-joint was seen. The next day he was carefully transported to the clinic. Examination here showed but little swelling of the knee, no fluctuation and patella found fractured transversely at junction of middle and lower third, the fragments separated about 2 ctns. As the lower piece was small it was deemed advisable to bring the two fragments together by the subcutaneous catgut suture. Chloroform was administered, but in five minutes from the first inhalation the patient stopped breathing and could not be resuscitated.

The autopsy showed no cause for the sudden death. Examination of the knee-joint showed the following: The fascia of the thigh over the patella was torn and turned in between the fragments, the periosteum on each side of the fracture was dissected backward about $\frac{1}{4}$ of a centimetre. Patella fractured transversely. Only a few blood clots found in knee-joint, but the upper recess was perforated in two places at its upper part. One of the openings measured $\frac{3}{4}$ of a centimetre in length while the other was much smaller and situated very near it, both openings were slit shaped. From these a large extravasation of blood had found its way between the crureus muscle and the bone, extending upward on the inner side of the thigh for a distance of 25 centimetres, below it extended to the bend of the knee and broadened out markedly. The layer of extravasated blood over the knee-joint

was about 2 centimetres thick, above it was much thinner. Altogether about 500 cc. of blood had been extravasated under the muscles.

In this case the rupture of the upper recess of the joint must have taken place while the patient was quiet in bed, for when he was taken home the joint was very much swollen and next morning the swelling had entirely disappeared. The rupture must have occurred early to permit the fresh blood to run so high up the thigh.

Two months later, a man, *æt.* 54 years, was brought in the hospital with fracture of the patella 8 days standing, and suffering from marked swelling of the thigh, due to an extravasation of blood which was easily seen extending as far as the pubis, later on it was observed high up in the gluteal region on the outer side of the thigh, while the anterior region of the knee-joint was free from dislocation. This patient's injury had been caused by the kick of an ox, and his physician found him after the accident, with the knee bent, and the fragments widely separated. He immediately placed the limb in the proper position and applied a splint. At that time there was considerable effusion in the joint, which effusion was not perceptible on removing the splint eight days later. In this case the time at which the rupture of the capsule took place can not be determined, but that a rupture did take place is proven by the fact that the extravasation was noticeable above the origin of the vasti muscles.

The behavior of a hæmatoma in a third case of fracture of the patella was entirely different from the extravasation noticed in the above cases. This case was a soldier, *æt.* 22 years, who sustained a fracture of the patella. There was a superficial coloration of the skin on the inner side of the thigh which gradually extended down the leg, giving the usual picture seen when the bursa over the patella has been so injured that its walls have been ruptured. The quadriceps in this patient remained perfectly soft.

Prof. Riedel states that if in two out of three recent cases this rupture has occurred, it ought not to be looked on as accidental, even though no writings exist about this subject, for he has looked through all the literature on suture of the patella and nowhere does he find rupture of the superior recess mentioned.

The swelling of the thigh in this form of accident need not be considerable; for a layer of blood 2 centimetres thick over the bone will not make much difference in the circumference of the limb. The diagnosis can be made by the discoloration which appears high above the origin of the vastus internus muscle, the anatomical relations of this muscle easily explain the reason for the dislocation appearing so high up.

After numerous experiments on the cadaver Riedel found that the upper recess of the knee-joint gave way when the joint was filled with about 200 cc. of fluid under a pressure of 25 to 30 ctms. of mercury. If perforation of the superior recess is more frequent than has hitherto been supposed, it would explain many things which up to the present have been more or less obscure.

1st. That puncture of the knee-joint after fracture of the patella is so often unsuccessful while it is almost always successful in simple hæmarthrosis.

2d. The rapid atrophy of the quadriceps on the one hand, and the good results of massage on the other. It is scarcely necessary to speak of the dangers of operating on such cases, for the slightest retention of secretions would lead to infection of the mass of extravasated blood situated under the quadriceps, and an operation can not give any better results than massage.—*Centblt. f. Chirg.*, No. 12, 1890.

F. C. HUSSON (New York).

IX. The Treatment of Transverse Fracture of the Patella. By E. MASING. In the course of a study upon the many and diverse methods of treating transverse fracture of the patella, Masing refers to the treatment by means of a plaster-of-Paris apparatus, and urges, as an objection against this, the most popular of non-operative methods among surgeons, that the limb soon atrophies and shrinks away from the dressing, leaving the upper fragment loose in the plaster-shell. He very modestly brings forward a method, suggested by himself, which consists of a piece of gutta percha, 7 cm. long and 7 cm. broad, and 3 mm. thick, which has a buckle fastened to one end, 4 cm. broad. On the other end of this plate of gutta percha

there is attached an elastic rubber bandage, corresponding in width to the buckle, and 45 cm. long. A half moon shaped opening is made in the centre of this flap for the accommodation of the upper edge of the patella, and upon both sides, at a distance of 9 cm. from each other, are placed two pieces of pure rubber tubing, 9 cm. long and 4 cm. in circumference, are fastened. In the free ends of these pieces of rubber tubing, short pieces of solid metal cylinders are placed and firmly fastened, and which, at their free ends, terminate in a small wire ring. The method of employment of this method is as follows ; A Volkman's or any posterior metal splint, reaching to the middle of the thigh, is selected and well padded, in which the limb is placed and bandaged, the portion corresponding to the region of the knee remaining free. The upper fragment is drawn downward and brought, as far as possible, in apposition with the lower. This may not be accomplished at once. Upon the upper edge of the upper fragment the half-moon-shaped opening of the gutta-percha plate above described is placed, and the elastic bandage attached to the same is passed around the thigh, including the posterior splint, and secured by the buckle in such a manner as to prevent the slipping upward of the fragment. The middle of a long piece of bandage is placed across the lower surface of the foot surface of the foot piece of the posterior splint, and its ends passed through the ring, attached to the rubber tubing of the gutta percha plate. The proper amount of tension having been secured by drawing upon them, they are passed posteriorly to the calf of the leg outside of the splint, and fastened by simply tying them around the foot-piece of the latter. By this means the upper fragment is passed downward and backward in the direction of the femur, and the fractured surface somewhat elevated. An ice bag completes the dressing. The tension is not kept up after 24 hours, as the surfaces are then found to be in contact; but the elastic girdle, as well as the longitudinal tension, is lessened, to conform to the comfort of the patient. Firm union is obtained in from 4 to 5 weeks, the patient being kept in a position to guard against separation of the fragments by the action of the quadriceps extensor.—*St. Petersburger Med. Wochenschrift*, 1889, No. 23.

GYNÆCOLOGICAL.

I. Rupture of the Vagina During Coition. By DR. PAVEL F. SMOLITCHEFF (Stanitza Labinskaia, Russia). A weakly-made and lean newly-married lady, æt. 31 years, applied to the author on account of sacral and rectal pain and discharge of blood and fæces from her genitals, which symptoms had made their appearance during her first coition with her husband, a healthy and normally developed merchant, æt. 26 years, 12 days previously. On examination, the major labia were found swollen and tender, the vaginal inlet totally closed with a red, unyielding, fleshy membrane, the posterior commissure ruptured, the wounds filled with blood and fæces. A forefinger pushed into the wound easily penetrated into the rectum, at the depth of 7 cm. The said fleshy membrane proved to be an abnormally developed hymen with a median, linear, raphe like groove and a minute (scarcely admitting a probe) orifice situated close to the urinary meatus. The recto vaginal fistule was closed with 3 metallic sutures, the wound healing on the 5th day. A few days later the hymen was divided along the median line by means of a scalpel and director, bleeding being easily arrested by torsion of an arterial branch, and cold water. The vagina and womb were found normal. The couple's sexual intercourse became quite comfortable ever since. Discussing the case, Dr. Smolitcheff points out that the rupture of the recto-vaginal septum must be attributed to the presence of an unyielding hymen, the septum proving to be a *locus minoris resistentiæ* and hence giving way under a violent pressure of the penis. He believes that the same state of things may be present in many cases of traumatic lesion of the vagina occurring during coition.—*Russkaia Meditzina*, No. 14, 1890, p. 212.

II. Episiotomy for Vesico-Vaginal Fistule. By DR. MIKHAIL P. IAKOVLEFF (Tambov, Russia). The author relates a highly interesting case of a robust married peasant woman, æt. 20 years, with a considerably narrowed pelvis, who sought his advice for a total incontinence of urine of 6 weeks' standing, which had appeared shortly after a very difficult labor of 4 days' duration. The major labia and

inner surfaces of the thighs were found congested and covered with excoriations, the genital slit and urinary meatus cicatrically contracted, the former admitting the little finger with but extreme difficulty, the latter being impassable even for a probe. There was present an incessant flow of a sanguinolent urine from the vagina. After a gradual dilatation of the vaginal entrance by means of Hegar's glass dilators, the examination revealed that the vaginal walls consisted all through of cicatricial tissue and that the anterior wall of the canal was occupied by an enormous vesico-vaginal fistule. On examination per rectum, there was found a slit-like recto-vaginal fistule situated in 5 or 6 cm. above the anus, the opening being surrounded by a cicatricial zone and freely admitting a forefinger. Any plastic operation being obviously impossible, obliteration of the vulva was proposed and accepted both by the unhappy young woman and her husband. Accordingly, a strip of skin about $2\frac{1}{2}$ cm. broad was excised from each labium and the raw surface stitched together with *z-étage* sutures, deep catgut and superficial silk. For about a week the patient had diarrhœa, but otherwise the after-course was most satisfactory, the wound healing *per primam* without any fever. When examined two months later the patient said she had been quite dry ever since; her urine accumulated itself in the rectum, being retained quite well; at certain intervals she felt a call and then either voided urine alone, or discharged urine mixed with fæcal matter." Her general state was very good.

This is a sixth case of episioceleisis in international literature; the preceding five were communicated by Baker-Brown, Prof. K. F. Slaviansky (of St. Petersburg), Gerasimovitch (Poltava), and Crespi (in *Le Sperimentale*, No. 6, 1886). [A case of obliteration of the vulva with formation of a recto-vaginal fistule, published by Dr. Silbernîk, may be found in *ANNALS OF SURGERY*, Sept., 1889, p. 232.—*Reporter*.]—*Proceedings of the Tambov Medical Society*, No. 1, 1890, pp. 11 and 15.

III. Ventrofixation in Uterine Retroflexion. By DR. I. I. LAKHNITZKY (Kiev). A sickly married woman, æt. 31 years, of a

phthisic family, was admitted to Prof G. E. Rein's clinic on account of incessant severe lumbar and pelvic pain, exceedingly painful and profuse menstruation, and a train of nervous (reflex) symptoms. the illness being of 5 years' standing (had commenced shortly after her having married a gonorrhœal and syphilitic man). On examination the womb proved to be bent backward and fixed by chronic inflammatory deposits. After all usual means had failed, Professor Rein made abdominal section, tore with fingers all (very dense) adhesions, removed the uterine appendages, except a portion of the left ovary, and stitched the uterus to the anterior abdominal wall after Leopold's method. The operation lasted 71 minutes. The after-period was utterly uneventful, the patient being discharged well in a month. When examined 6 months later she was found strikingly improved, having gained in weight 20 lbs; catamenia had become painless and altogether regular; all symptoms had disappeared; the womb proved to be anteflexed, its fundus firmly adherent to the abdominal wall, a formerly large perimetritic deposit had dwindled away, leaving nothing but a slight infiltration about the left ovary. Analyzing the case and reviewing the subject, Dr. Lakhitzky draws the following conclusions: (1) Ventrofixation of retroflected womb is fully justified in certain well-selected cases. (2) The best method is that introduced by Professor Leopold. (3) In such cases in which the operation is combined with removal of the appendages, a healthy portion of this or that ovary should be left in the pelvis in order to secure the appearance of subsequent menses. [*Cui bono?* To have catamenia for the sake of catamenia? or to enable the woman to become pregnant and to have her uterus again detached from the abdominal wall? and to allow the woman to bring forth sickly children from her syphilitic husband, as in the case given?—*Reporter.*] — *Pract.*, No. 7, 1890, p. 174.

VALERIUS IDELSON (Berne).

IV. The Operative Treatment of Retroflexion of the Uterus. By DR. R. FROMMEL. The author recommends in a certain class of retroflexions where milder therapeutic measures have been unavailing, shortening the utero-sacral ligaments. The patient is so

placed as to put the ligaments in the stretch, and after the uterus is freed from its adhesions and drawn well forward each utero-sacral ligament is transfixed near its attachment to the uterus and is fastened to the peritoneum of the lateral walls of the pelvis. This shortens the ligament and raises the uterus. The operation has this advantage over ventral fixation that it is not restricted in an abnormal position and its normal movements are not restricted. Professor Frommel states that this operation is only to be tried in very severe cases, and states that for two years he has not been in the position where he was obliged to treat a case of retro-deviation by operative measures.—*Centblt. f. Gyn.*

Vaginal Fixation of the Retroflexed Uterus by Schucking's Method. Schucking (*Centblt. f. Gyn.*, Feb. 22, 1890), states that sixty-two cases have now been reported. In the first twenty the silk ligatures were removed too soon and no pessary was used, nevertheless twelve patients were permanently cured. In the last forty three cases there was not a single failure, but as the majority of the operations were performed during the past year, it is too early to report positive results. The writer opposes ventro-fixation on the same grounds as Freund, viz., that "the non-gravid uterus does not belong in the abdominal but in the pelvic cavity."

The following points should be remembered in regard to the technique. The ligatures should be left in situ for eight or ten weeks. A pessary must be introduced at once. If the urine is bloody, showing that the bladder has been wounded, the organ should be irrigated with a solution of thymol, and a pencil of iodoform or salol should be inserted into it. The uterus should be drawn down slowly and steadily until the operator satisfies himself that the needle can be passed beneath the right pubic bone. The point of the needle must be protruded at the fundus, and not lower down on the anterior uterine wall.

To avoid cutting through the anterior lip of the cervix with the ligature the latter may be passed through a round button, or it may be carried directly through the substance of the lip. It should be noted that the suture does not pass behind, but close beside the bladder. There are no contra-indications to this operation. It is only necessary to free the adhesions first according to Schultze's method.

V. Vaginal Extirpation of the Uterus. By DR. MACAN (Dublin.) The author says that in view of the better technique and improved statistics, the following questions may be considered:

1. *What is the mortality of the operation?*—This should be judged from the practice of one who has had large experience and he quotes the results of Professor Leopold, of Dresden, 110 cases in all. In 80 of these cases the operation was performed for malignant disease; in 17 for myomata; in 5 for prolapse; in 6 for disease of the appendages, and in 2 cases for profound neuroses. Of the 80 cases performed for malignant disease 4 died. Of these fatal cases one died of ileus and 3 of sepsis. In 1 case, when the disease was very extensive, the sepsis took its origin in a portion of the carcinomatous mass that was left behind. In a second case a suture which was found necessary to stop hæmorrhage, was passed by mistake through the rectum, and at the post-mortem it was found that the parametrium and the serous coat of the intestines were involved. In 2, therefore, of the fatal cases Professor Leopold found that the disease had extended so far as to make the cases quite unsuitable for the operation.

2. *In what percentage of cases when it is done for cancer may a permanent cure be reasonably looked for?*—Of Leopold's 80 patients only 42 had been operated on for more than two years, and of these 42, 27 are still free from recurrence, therefore $64\frac{1}{2}\%$ have been saved by the operation.

3. *What are the indications for its performance in malignant disease?*—High operation is objectionable because one does not know beforehand how high the disease extends and the mortality is greater if anything than in hysterectomy. The dangers and disadvantages of Freund's operation and supra-vaginal amputations exclude them from comparison. A difficult question to settle is how much parametria and fixation of the uterus contraindicate the operation. Slight infiltration certainly does not, as such infiltration is frequently of an inflammatory nature. In 14 of Leopold's cases in which this was present the disease only returned in 3. As long as the uterus can be drawn down so long is the operation allowable. It would be better to dissect an

involved anterior wall than at once to give up hopes of a permanent cure by operation.

4. *In cases in which the operation fails to bring about a permanent cure, is the condition of the patient, when the disease recurs, better or worse than it would have been had the operation not been performed?*—According to Leopold this question is answered in the affirmative although many would answer it differently. The author sides with Leopold.

5. *Is the mortality of the operation in skilled hands sufficiently low to justify us in resorting to it in cases that are not necessarily fatal to life like cancer?*—If it is admitted that the mortality when performed for cancer may be reduced to 6%, it may readily be conceded that other conditions will warrant its performance. Wm. A. Martin has performed it several times in cases of menorrhagia which had resisted curetting and even removal of the ovaries.

6. *What is the best and simplest way of performing the operation?*—Vagina thoroughly disinfected: Lithotomy position. Cervix drawn down. Simons' speculum. Cervix well separated from bladder and when done thoroughly lessens danger of tying ureter. Cervix freed posteriorly so that nothing but that portion of the broad ligament is left which carries the vessels to the uterus. In order to tie the right broad ligament the cervix is firmly drawn over to the left side, and the lowest portion of the ligament carried forward in the tip of the left index finger and transfixed with a stout (strongly curved) aneurism needle, carrying a ligature from before backward, and this portion tied and separated from the uterus. The same thing is now done on the opposite side and thus small portions of the broad ligaments are alternately cut until the uterus is finally separated from its attachments. The danger of including the ureter is best avoided by separating the bladder freely from the uterus and drawing the latter well down while passing the ligature. After the uterus has been removed the vagina and Douglas' space should be thoroughly disinfected and the stumps of the broad ligaments drawn gently down by means of the ligatures, the whole well powdered with iodoform and the ligatures cut short. Drainage tubes or plugging with iodoform gauze is not necessary. The af-

ter-treatment of these cases is simplicity itself; for unless the ureters have been tied or infection takes place the patients' temperature is quite normal, and they are quite free from pain. The stitches need not be disturbed for ten or twelve days, and the patient may be discharged in three weeks.

A narrow vagina may be incised. An immovable uterus becomes more movable after the vaginal wall has been incised all around it. If one does not attempt to tie too large a mass of broad ligament there is no danger of hæmorrhage.—*Brit. Gyn. Jour.*, May, 1890.

A. H. BUCKMASTER (New York.)

V. Uretero-Uterine Fistula. By A. H. VAN DER WEERD (Leyden, Holland.) The patient, æt. 22 years, delicately built, but otherwise healthy. She was suffering from a uretero-uterine fistula which was caused by traumatism during labor. The pelvis presents no abnormalities. The daily measurements of the urine show that the double quantity is passed per urethram compared with the amount passed per vaginam. The urethra was dilated into the bladder and the orifices of the ureters were sought for. They could soon be detected by the illuminating aid of reflected sun-light. The right ureter could only be sounded for a distance of one centimetre; it was also noticed that no urine came from it.

After four weeks, in which time the vesical catarrh had nearly disappeared, Prof. Treub performed extirpation of the right kidney after Simon's method. The ureter and vessels were ligated with catgut. The cavity, after cleansing, was tamponed with iodoform gauze. On the fifth day the tampons were taken out and the wound closed by secondary suture. A compressing dressing was applied and the patient advised to lie on the right side. The meanwhile recurring vesical catarrh was combatted by means of injections of nitrate of silver and boracic acid solutions. Between the seventh and eleventh day all the sutures were removed. Complete union with the exception of a very small granulating surface took place by first intention. The urine was thus completely clear and did not contain any albumen. The daily secretion of urine amounted to 1400 to 1800 ccm. The patient

was dismissed. The diagnosis was beginning suppurative pyelonephritis (surgical kidney).

The author could only find 11 cases (inclusively that of Treub) of uretero-uterine fistula in the whole medical literature. Six concerned the left, three the right ureter; twice it was impossible to decide. The symptomatology, diagnosis and therapy of such cases are discussed by the author and also the treatment employed by different authors.

The author, taking the experiences made in Crede's and Treub's cases as a basis, arrives at the conclusion that in all cases of uretero-uterine fistula, which depend upon suppurative and septic processes, extirpation of the kidney should be performed unconditionally, if one is certain that the other kidney is healthy.—*Nederl. tijdschr. v. Verlosk. en Gynak.*, Jahrg. 1, Heft 2.

VII. A Tuberculous Vesico-Vaginal Fistula. By TÖRN-
GREN (Helsingfors.) Catherine P., æt. 33 years, entered the hospital on July 31, 1888. The patient's mother, æt. 70 years, enjoyed then excellent health; her father died at the age of 70 years of some lung disease. During childhood the patient had always been well; her menses appeared at the age of 16 years for the first time, the menstruation being always regular in duration and quantity of discharge. She married at her eighteenth year; she passed through four pregnancies, the three first ones going to full term. The fourth terminated in July, 1886, by a normal labor, but after a duration of three days; the infant weighing 1800 g. She had already been troubled some years by profuse leucorrhœa and a little later by frequent micturition of a urine at first clear and later becoming turbid. During her last pregnancy she remarked quite an amelioration. After the labor, she remaining in bed eight days, she was well some two months, after which time the frequent micturition appeared again, became more frequent and she also noticed that the urine flowed continually and involuntarily. In the middle of August, 1887, a stiffness and tumefaction of the left knee, with aggravation of the general condition set in; never any cough.

PRESENT STATE.—The patient, extremely emaciated, weighs 38.2 kilog., has an evening rise in temperature; the left knee stiff and swol-

len; the organs of the thorax are normal; pelvis is normal. The uterus is small and movable; the cul-de-sacs are free. The mucous membrane of the cervix is a little ulcerated around orifice, with a grayish secretion from the left side. The mucous membrane of the vagina is pale. In the vesico vaginal septum there was a loss of substance including all the layers of the tissues from the mucous membrane of the bladder to that of the vagina, having a length of three and a half centimetres, a breadth of two centimetres and situated three centimetres from the orifice of the urethra. A little higher up there was an ulceration one-half centimetre in diameter. The bases and sides of all the ulcerations are perpendicular and of a grayish color. No cicatrices at any other place; the posterior wall of the vagina is normal. The bacillus tuberculosis is found in the secretion of the cervical canal (Ehrlich's method). The urine is clear and does not contain albumin. Her husband is well, does not cough, and has no disease of the genital organs. The patient left the hospital on August 29. The general condition and local affection were treated by iodoform.—*Finska Lakaresallsk. Handlingar.*, No. 1, 1889.

A. PICK (Boston).

VIII. Laparo-Myotomy. By Dr. FRITSCH. Fritsch, in his contribution to the literature of uterine myomata and its treatment, gives a critical review of the different operative methods employed in the removal of the same. The operation introduced by himself is described, and consists essentially of the following steps: He applies a provisional ligature and removes that portion of the tumor above the same for the extent of from 6 to 8 cm. A wedge-shaped portion is then removed from the stump in a vertical direction, the section of the stump being for this purpose made parallel to the wound in the abdominal wall. Care is taken not to loosen the attachments to the bladder. The cervical canal is cauterized and washed with iodoform; finally, the uterine vessels are secured, after which the funnel shaped cavity of the stump is closed by deep sutures, closely approximating its walls. The elastic ligature is now removed, the lateral stumps of broad ligaments are drawn to the middle line of the uterine wound.

and the stump fixed in the abdominal wound by suturing the same to the parietal peritoneum above, below and laterally. The parts are dressed by packing with iodoform gauze. Of 23 cases operated upon by this method but 2 died. Of these 1 died of ileus and 1 of uræmia following an old pyelonephritis.—*Sam. klin. Fort.*, No. 339.

G. R. FOWLER (Brooklyn).

IX. Case of Porro-Cæsarean Section in a Rachitic Dwarf. By Dr. Cullingworth (London). A rachitic dwarf, æt. 25, had twice previously been pregnant; the first time she was delivered by craniotomy, and the second time by induced labor at the seventh month, the child being still-born. Becoming pregnant again, Cæsarean section at the full term was advised and accepted. The pelvic measurements were:

Distance between the iliac spines,	-	-	-	9 $\frac{1}{4}$ inches.
Distance between the iliac crests,	-	:	-	9 $\frac{3}{8}$ inches.
External conjugate,	-	-	-	6 $\frac{1}{2}$ inches.
Diagonal conjugate,	-	-	-	3 $\frac{1}{8}$ inches.
Actual conjugate (ascertained at last labor),	-	-	-	2 $\frac{3}{8}$ inches.

Under ether, an incision was made in the middle line, from a little above the umbilicus to a point three inches above the pubes. Afterwards this incision was enlarged upward to allow the uterus to be turned out of the abdominal cavity. The uterus having been turned out, an Esmarch elastic tube was passed loosely around the cervix and secured by pressure forceps. A vertical incision, four inches and a half in length, was now made in the middle line of the uterus, almost through the entire thickness of its wall, and completely so in the centre of the incision where the membranes protruded in the form of a small pouch. This was punctured and the liquor amnii allowed to escape. The incision was then enlarged, exposing the left shoulder of the fœtus, which was then extracted, the left arm being seized first, then the head, which was lowermost, and then the rest of the body, the funis being promptly clamped and cut. Beyond a spurt from a

sinus, divided in opening the uterus, there had been no hæmorrhage of any importance.

The elastic tube having been tightened, the hand was introduced into the uterus and the placenta and membranes withdrawn. The uterus was then swabbed out with antiseptic pledgets, and the wound closed by six deep and six Lembert sutures. The ovaries and tubes were then ligatured and removed to prevent subsequent conception. The uterus, which had hitherto been fairly well contracted, now became relaxed, and free hæmorrhage occurred, not only from the vagina, but from the wound. All measures to check the bleeding having failed, a serro-nœud was applied, two guarded pins were passed through the uterine tissues on the distal side of the constricting wire, and the uterus cut away with a knife about half an inch above them. The toilet of the wounds and the abdomen was then performed with great care, the stump was dusted with iodoform, iodoform gauze was packed around it beneath its everted edges and beneath the pins and serre-nœud, wood-wool pads were placed over the stump and incision, and the dressing was completed by covering the whole abdomen with a thick layer of absorbent wool, and applying a many tailed bandage over the whole.

The operation lasted an hour and twenty-five minutes. The child, a female, was living, and weighed $6\frac{1}{4}$ pounds. The patient made a most favorable recovery, and both mother and child left the hospital well on the 34th day.—*London Lancet*, May 17, 1890.

JAMES E. PILCHER (U. S. Army).

ON FIBROUS STRICTURE OF THE ŒSOPHAGUS.¹

By KENDAL FRANKS, M.D., F.R.C.S.I.,

OF DUBLIN.

SURGEON TO THE ADELAIDE HOSPITAL.

IN 1882, I had the honor of laying before the Surgical Society of Ireland, the details of a case of cicatricial stricture of the œsophagus, which I treated by rupture, followed for some time by the passage of bougies. I then entered at some length into the whole subject of fibrous stricture of the œsophagus, its causes, usual situations, symptoms, pathology and treatment. I do not therefore propose on the present occasion to cover the same ground, or to weary you with "reiterated logic," but rather to give the details of some cases which have been, from time to time, under my care, and shortly to discuss the different methods of treatment adopted.

The first case to which I shall refer, is the one to which I have already alluded, and to which I should now like to call attention as I have had during the past year an opportunity of seeing the patient, and of estimating the value of treatment after the expiration of more than eight years.

The patient was a girl, æt. 20 years, who came under my care, in the Throat Hospital, on October 17, 1881, suffering from a stricture in the œsophagus, situated about three quarters of an inch below the cricoid cartilage. The cause assigned was the impaction of a hard bread crust in the œsophagus four and a half years previously. Dysphagia had come on very gradually and, when I first saw her, even fluids were swallowed with considerable difficulty. She had lost very considerably in weight, and was anæmic and emaciated. The day after her admission I tried to get in a No. 8 catheter (English gauge). Great difficulty was experienced, as the œsophagus was much dilated above the stricture and I had to probe about against the floor of this

¹Read before the Royal Academy of Medicine in Ireland, March, 1890.

dilatation with the olivary point of the catheter before I could find the opening. At last, and after many attempts, I succeeded in worming the catheter through, and I then left it *in situ*. It was retained for an hour, during which period the patient sat on a stool, leaning over a basin, while stringy mucus and saliva in great quantities poured from the mouth. After its withdrawal she experienced great relief and shortly afterward was able to swallow some beef tea with more ease. This gradual process of dilatation was continued daily, and on the fourteenth day I was able to pass a No. 12 catheter through the stricture. Two days later I passed Otis' dilating urethrotome, without the blade, and dilated the stricture to the full size of the open instrument. Immediately after its withdrawal I introduced an ordinary œsophageal bougie (about three-eighths of an inch in diameter). This was retained for several hours. From this date, November 2, dilatation was continued by means of Mr. Tufnell's conical rectal bougie, and seven days later, November 9, I was able to get in the full sized bougie, the part which was held in the stricture measuring five-sixths of an inch in diameter.

This large bougie was passed daily till December 22, and retained each time for periods varying from one to four and a half hours. She was then discharged, and went to a situation in the country.

I have frequently heard of her since, but last year I had an opportunity of examining her, as she came up to Dublin because she thought the stricture was again contracting. I was then very gratified to find that though there was some contraction it was very slight; it was, however, sufficient to make the passage of the full-sized rectal bougie a matter of great difficulty. I then determined to try the effects of electrolysis, and after two or three sésances, I found that this electrode measuring two-thirds of an inch in diameter passed with the greatest ease. The rectal bougie could also be introduced with ease, so I sent her back to the country.

I think we may look upon this case, though not absolutely, yet to all intents and purposes, as cured; since recontraction was so very slight after the lapse of eight years.

The second case was that of a lady, æt. 30 years, the daughter of a doctor in the North of Ireland, whom I first saw on December 8, 1883, in consultation with the late Dr. Robert McDonnell, at whose request I undertook the treatment. The history of her case was as follows. She stated that in the spring of 1870, nearly fourteen years previously, she had an attack of acute tonsillitis. The tonsils were cauterized with nitrate of silver, and a gargle was ordered for her, of the strength of

which she complained very much. Shortly afterward she experienced symptoms of œsophageal obstruction, for which her father consulted a doctor in a northern town. Both the patient and her father declared that he passed a bougie very roughly, and hurt her very much, and that she was unable to swallow solid foods for days afterwards. Subsequently to this she experienced recurring attacks of dysphagia, lasting for three or four days, with intervals of three weeks or so, during which time she was nearly quite well. Gradually the intervals became shorter and the periods of dysphagia longer. In 1879, being in Manchester, she consulted a doctor there. He, believing the stricture to be spasmodic, galvanized the œsophagus every second day for weeks. He also tried to pass a bougie, but found great difficulty and much pain was caused. She could not swallow anything solid for weeks afterwards, even when minced fine. From that time until I saw her with Dr. McDonnell, no attempt of any kind had been made to remedy her condition, which on December 8, 1883, was as follows: For years she had not been able to swallow anything solid. Her diet consisted of beef tea, thin arrowroot, milk, and sometimes bread soaked in tea. Her breakfast, which consisted of two cups of milk, took her an hour and a half to swallow. Luncheon about an hour, and dinner between one and two hours. The food which was taken in very small quantities at a time did not regurgitate, but when swallowed took a long time to go down. Eructations occasionally came on, causing great pain referred to the sternum and between the shoulders. She was given a little water to swallow and a stethoscope placed at the back on a level with the third dorsal vertebra and a little to the left, revealed a peculiar scraping sound, which could even be heard sometimes at a little distance; but the normal glou-glou was quite absent. Dr. McDonnell and I both made several attempts with variously sized bougies to pass the stricture, but every attempt failed. We were both quite satisfied that the stricture was organic and cicatricial, and situated in the upper part of the œsophagus, about an inch below the cricoid cartilage.

On December 13 she came to my own house, and then after many attempts, I at last succeeded in introducing a No. 1 urethral bougie, which was firmly gripped. I left it in situ for a few minutes, when an attack of laryngeal spasm came on which obliged me to withdraw the bougie, and which was quickly relieved by nitrate of amyl. Two days later, No. 1 was again passed and retained ten minutes, no laryngeal spasm resulting. On December 17, two days later, a fine bulbous pointed bougie No. 3 was got in and retained 16 minutes. On the 19th, the same size was retained 75 minutes. The same bougie was

passed every second day until the 24th. My note on that day was: "She does not think she can swallow more quickly, but she can do so with less pain and spasm, and has no choking fits now which she used to have frequently." On that day Mr. J. K. Barton saw her with me. He entirely concurred in the diagnosis, and we then discussed the advisability of nicking the stricture with Maisonneuve's urethrotome, but this was never done, as the gradual dilatation seemed to be progressing satisfactorily. I will not weary you with a daily record of the progress made. I will only call attention to the chief incidents as they occurred in their order, merely saying that by slow degrees the size of the bougies was increased. On December 31, 1883, No. 5 was got in. On January 2, 1884, I find this note: "It is a remarkable thing that when a tight fitting bougie is first attempted, it always brings on retching, often violent, but a bougie which is only moderately tight or is loose in the stricture, never does." By January 30, I had attained to No. 14 urethral bougie, English gauge. On February 13 I began the use of Tuffnell's rectal bougies, and passed No. 3. On May 5, 1884 I passed Tuffnell's full size rectal bougie, and continued its use with occasional intermissions until July 4, when she went home.

During this period, extending over nearly seven months, the bougies were passed almost without intermission every second day; the urethral bougies were retained for periods varying from 10 minutes to 3 hours at a time, during which time large quantities of stringy mucus poured from the mouth. The rectal bougies on account of their size could not be retained so long, but they were kept in for periods varying from 12 to 45 minutes.

The symptoms, as we might expect, improved *pari passu* with the enlargement of the stricture. Thus on January 13, when the stricture accommodated a No. 9 bougie, her husband estimated that an hour and a half had been saved at her meals per day. On February 25, she wrote to me to say that her dinner had consisted of roast duck, cut fine, and mashed potatoes; this was the first solid food she had eaten for years. When she left Dublin on July 4, she could eat whatever she liked. She has visited me frequently since, and about twice a year I pass a bougie for her, but there is apparently no recontraction of the stricture; this is probably due to the fact that she is herself alive to the danger of recontraction and accordingly comes at intervals to get the bougie passed.

The next case is that of a lady, æt. 45 years, who consulted me for the first time on June 18, 1886, for difficulty in swallowing; and it is especially interesting as it was the first case of œsophageal stricture in

which I tried electrolytic treatment. She had suffered from gradually increasing dysphagia for 15 years, for which she could assign no cause, when I saw her she was extremely emaciated, markedly exsanguine, and of highly nervous temperament. This, I presume, was the reason that her dysphagia had always been looked upon as spasmodic and had been treated invariably by tonics. She could swallow fluids with comparative ease, but any attempt at solids brought on attacks of choking which generally lasted an hour. Bread she found the easiest solid to manage, and meat was always the worst. The first day I saw her, I tried to pass an œsophageal bougie but failed, and then I tried a No. 12 urethral bougie, but that was also unsuccessful, as I could not get it past a smooth, tough obstruction which was localized at a spot one inch below the level of the cricoid cartilage. The result of my efforts was severe pain in the back of the shoulders and in the chest. She was, however, quite well until the next morning when a small piece of bread brought on an attack of choking, which was followed by violent spasms and retching which lasted the whole day. I made no further attempt for 4 days, and then on June 22, I succeeded in getting an olivary pointed gum-elastic bougie (No. 10) through the stricture. I then found that the stricture was apparently due to a ring of smooth, tough, fibrous tissue. The next day the same bougie was passed and retained 10 minutes. On the following day, June 24, I passed an electrode down to the stricture, and connecting it with the negative pole of the battery, passed a weak current, 9 Leclanche's cells, for 10 minutes, after which a No. 16 electrode passed easily. The electrolysis caused very little distress. On the 25th the same electrode was used for about 10 minutes, and again for 8 minutes on the 26th. On the 28th I passed No. 20 electrode down to the stricture, but could not get it through. I then turned on the current, 4 times of 2 minutes each. At the third the electrode passed through the stricture with ease. On the 29th and 30th the same electrode was used. The treatment was now suspended until July 5, on account of the supervention of the catamenia which were always abundant and necessitated her keeping to her bed. On that day I found the No. 20 could pass easily, merely hitching at the stricture; but the current was not used. At this time she could swallow, she said, without difficulty, her throat felt so large. She was obliged to return home to the West of Ireland for family reasons, so that I did not again see her until the 25th of the following October. I then found that there was some recontraction. I could just get an electrode three-eighths of an inch in diameter through the stricture. The following day I electrolysed the stricture for 10 minutes and suc-

ceeded in passing a large sized electrode, five-elevenths of an inch in diameter. On October 30, after electrolysing the stricture with 12 cells for a few minutes, I passed the largest electrode I possessed, measuring two thirds of an inch in diameter. On November 1 and 2, electrolysis was employed for some minutes each day, the largest electrode being used and on November 3, 1886, she returned home.

I have seen her at long intervals since, but I have been unable to detect any sign of recontraction. I saw her last year and was surprised to see how fat she had grown, and how improved she was in her general health. She never experiences now the slightest difficulty in swallowing her food. It is worth while observing that from the day I first saw her on June 18, until she returned home on November 3, she visited me 16 times, and electrolysis was employed on 11 occasions. This forms a striking contrast with the time required for gradual dilatation by bougies alone.

The fourth and last case I have to record is that of a man, æt. 68 years, by occupation a railway guard, who has recently been under my care. Gradually increasing dysphagia had been coming on for 7 or 8 years. At the beginning there were intervals during which he could swallow quite well. He could assign no cause for the disease and never had had syphilis, or any previous disease or injury to the gullet. Until three years ago he was able to eat his ordinary food, but then he had to begin to mince his food. In May or June last, he had to give up eating meat or any solid food. His food lately has consisted of the soft part of bread broken into cocoa, soup, or chicken broth with bread soaked in it and for supper Benger's food. This he could swallow well, but nevertheless he had been emaciating rapidly. When he came to me on December 17, 1889, I found I could pass a fairly large sized olivary pointed bougie (somewhat less than $\frac{1}{2}$ inch in diameter) through an apparently fibrous stricture situated, as nearly as I could measure it, about 4 centimetres from the orifice of the œsophagus. On passing a bougie downwards, a second stricture was discovered close to the cardiac orifice of the stomach. A series of measurements were taken which showed that there was a distance of $15\frac{1}{2}$ centimetres between the two strictures; and therefore the lower stricture was situated about 4 or 5 centimetres above the cardiac orifice. At this time I could not estimate its size as I could not succeed in passing any bougie through it. I therefore devoted my attention during the next few days to dilating the upper stricture. On December 21, his weight in his clothes was 10 st. $5\frac{1}{2}$ lbs. On December 24, I passed an œsophageal dilator, made by Matthieu, through the upper stricture and having dilated it to its

full size (about one inch in its broadest diameter) I withdrew it slowly. The subsequent pain was very slight, and he told me he thought he could get down his food more easily.

Up to December 30, I had not been able to pass even a small bougie through the cardiac stricture, and I discussed both with the patient and with Dr. Ford of Waterford, who sent up the patient to me, the propriety of dilating this lower stricture with the finger through an opening made in the stomach, as recommended and successfully performed by Loreta of Bologna; but on this day I succeeded in passing this œsophageal bougie. I then determined if possible to forcibly dilate the stricture and accordingly, having succeeded in passing the same œsophageal dilator as before, I opened it, until it measured about $\frac{3}{4}$ of an inch in diameter, and withdrew it. The stricture was found to be extremely firm and resisting and the dilating process caused some pain, which continued during the night and was referred to a spot between the shoulders. The following day deglutition seemed to him to be easier, and I then succeeded in passing a No. 20, and on January 1, a No. 28, into the stomach. This No. 28 measures $1\frac{1}{2}$ inches in circumference. His weight was again taken, when it was found that he had gained 1 lb. 3 oz. since December 21. The bougie was kept in for 15 minutes.

On January 3, I began electrolysis and repeated it every day until the 9th, and again on the 13th and 16th, that is, in all, 9 times. Both strictures were electrolysed for about 15 minutes each time. On January 10, I was able for the first time to pass a full sized œsophageal bougie through both strictures into the stomach. It was passed daily till the 17th when I saw him for the last time; on each occasion it was kept in from 15 minutes to half an hour. On January 4, he was able to take meat for the first time and continued it daily afterwards. His weight on January 17 was 10 st. 11 lbs., that is, he had gained since December 21 $5\frac{1}{2}$ lbs. in weight. He returned home on January 18. He has gained also considerably in strength, and the day before he left me, told me with pride that he had walked the whole way from Phibsboro road to my house.

Dr. Ford, of Waterford, who has been attending him since his return home, and who has passed the bougie successfully every second day, wrote to me on February 13, saying: "Ned could not be better. He saw you on December 17, and since then he has gained 18 lbs. in weight. His appetite, whetted by 2 or 3 trips to Tramore every day, is excellent, and he has no difficulty in deglutition. * * * This morning I noticed his uniform coat fitting him as it should. There was a time when it hung loosely on him."

I heard from the patient himself on March 13. He tells me there is no difficulty in passing the bougie down into the stomach. This is done every second day and left in for 15 minutes each time. He says he gained 28 lbs. between January 21, and March 13.

These four cases of fibrous stricture of the œsophagus are instructive in many ways. The last one, of course, is open to the objection that the treatment has been too recent to speak with any confidence as to the ultimate result, and I also confess that, for a time, I was impressed by the doubt as to whether some malignant disease were not at the root of it, having regard to the age of the patient, viz., 68. But, on the other hand, a history of gradually increasing dysphagia extending over a period of eight years, and the improvement which followed the process of dilatation, are in favor of the strictures being of a cicatricial nature. Added to these the sense of touch which gave the impression of a dense band or thickening instead of the nodulated tumefaction of a malignant growth, I think I am justified in looking upon the case as one of a benign character, although the possibility of a malignant neoplastic growth cannot be entirely dismissed from view.

In the first place these cases show that forcible dilatation or rupture, when followed by systematic treatment, may be useful in some of these cases. Its advantages are that it hastens the process of dilatation, especially in cases where it is desirable to open up the passage with as little delay as possible; and secondly it is a much safer proceeding than dividing the stricture with a sharp instrument. There can be little doubt that division of a stricture, where we can regulate the amount, position and direction of the incision, is ideally the best, but unfortunately in the œsophagus this is not exempt from danger. In Mackenzie's book on the Throat and Nose, he gives statistics of eleven cases of cicatricial stricture, in which internal œsophagotomy was performed with three deaths, all due to the operation. This gives a percentage of 27.28%. Rapid dilatation, on the other hand, is comparatively a safe procedure, and has proved beneficial in the limited experience I have had of it. Electrolysis, I believe, will prove of great service

in these cases, which are acknowledged to be difficult and often intractable to treat. Our experience of its use in œsophageal strictures is, of course, very scanty, but in similar affections of the urethra it has found many warm supporters. Many will remember the interesting paper on this subject read before this Academy by Mr. Patrick Hayes. It was mainly owing to that paper that the idea occurred to me to try it in œsophageal strictures of a cicatricial nature. Case III seems to show that by electrolysis we can obtain a more rapid dilatation than by the simple passage of bougies, and in her case, certainly, the improvement appears to be permanent, as there was no recontraction three years afterwards. In the last case I also think it was of use, and I think the enlargement of the cardiac stricture especially was hastened by the use of the electric current.

There are other points of interest which time will not allow me to refer to now—but I trust that other surgeons will be induced to try electrolytic treatment of these strictures and to publish the results, so that by accumulated knowledge we may be able to arrive at a just estimate regarding its utility.

“Organic stricture, of whatever kind, is incurable. *Dilatation*, by means of bougies increasing in size, may afford partial and temporary relief. * * * The principal use of a bougie is to determine the existence of a stricture, its situation and nature, and thus to complete the diagnosis of this affection—due caution being observed in passing the instrument.”—*Gant's Student's Surgery*, 1890, p. 536.

A CASE OF CHOLECYSTOTOMY FOR GALL-STONES.

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THE operation of cholecystotomy has, of late, become quite a common operation in Europe; in America, however, but few cases have been reported. The operation was first described over 150 years ago by Petit. It was forgotten until Marion Sims, in Paris, in 1878 revived it. The result in his case was fatal.

In 1879 Mr. Lawson Tait successfully performed the operation on a woman, æt. 40 years, and since that time it has been frequently performed with satisfactory results. Mr. Tait¹ has performed cholecystotomy some 55 times, with 3 deaths, 2 of which were due to cancer of the liver.

The difficulties of the operation vary greatly in different cases. When the gall-bladder is distended, its wall can be sutured to the abdominal parietes, then incised, and the gall-stones extracted; but when the gall-bladder is shrunken and small, or altered by inflammatory action, the operation of cholecystotomy may present unusual difficulties.

The operation of cholecystotomy, or removal of the gall-bladder, is advocated by some surgeons (e. g., Langenbuch, of Berlin, and Knowsley Thornton, of London) as preferable to cholecystotomy. The operation is a much more serious one, and the results obtained are no better than in cholecystotomy. The one point in its favor is that it prevents a recurrence of the conditions which necessitated the operation, but on the other hand in many cases, owing to changes produced by inflammatory action, it is impracticable and it will not relieve an obstruct-

¹Edinburgh Medical Journal Oct. and Nov., 1889.

ed common duct. No doubt in some cases cholecystectomy is advisable, whilst in others, which form the majority, cholecystotomy should be practiced. More evidence is necessary before exact rules can be laid down as to the choice of operation.

The diagnosis of gall-stones in some cases is very easy, whilst in others most difficult. The case I am about to relate, comes under the latter category, for it was thought to be a case of malignant disease until the abdomen was opened and a close investigation of the tumor showed it to be a very much altered gall-bladder enclosing three large stones. Without further preliminary remarks I shall now give a report of the case:

Mrs. B. æt 51 years, was sent me by Dr. Lynch of Winnepeg, Man., in June last, suffering from a tumor of the abdomen which he thought might be relieved by operation. She is a fairly well-nourished woman, of rather blonde complexion, mother of eight children. Has lived in India and has always enjoyed good health up to a year ago. When on a visit to England in 1889, she was first troubled with dyspeptic symptoms, discomfort after eating, and pain in the epigastrium. During the past year has been losing flesh and recently has rapidly become thinner. Six weeks before consulting me she was suddenly seized with a severe pain in the epigastrium accompanied by incessant vomiting and great tenderness over the abdomen with elevation of temperature. Dr. Lynch at this time first detected a tumor to the right of the umbilicus about as large as an orange, which was tender and quite movable. Since the first attack she has had two others precisely similar and has never been free from pain and discomfort about the abdomen especially after eating or moving about much. Owing to the severe continuous pain she has been more or less under the influence of morphia for the last six weeks. Has never had jaundice. I saw her on June 13, 1890, for the first time with Dr. George Ross and Dr. A. A. Browne. On examining the abdomen we easily made out a tumor apparently about the size of a foetal head to the right and overlapping the median line below the umbilicus. The tumor was smooth on the surface and deeper down appeared to consist of a hard irregular mass. It was freely movable but was most easily pushed upwards and to the left; dull on percussion and tender to the touch. Temperature and pulse normal. We all came to the conclusion that we had to do with a malignant growth connected with the pyloric end of the stomach or even

probably with the bowel. We decided to recommend an exploratory incision and were prepared to remove it if possible.

Operation June 17, 1890. Assisted by Dr. James Bell I opened the abdomen in the median line immediately over the tumor at the level of the umbilicus. On opening the peritoneal cavity an elongated portion of the liver was first met with and this was the smooth surface of the tumor which had been previously felt. Beneath this portion of the liver was a large hard mass covered by omentum and intestine. The mass felt hard and nodular like a new growth and was almost the size of a base-ball. The liver appeared to be cirrhotic and although attached to the tumor was not

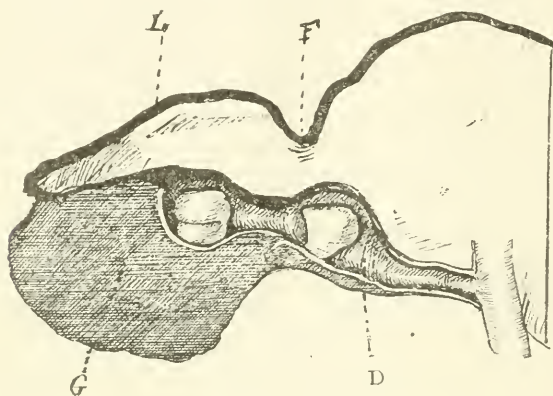


FIG. 1.—SKETCH OF SUPPOSED CONDITION OF GALL-BLADDER.

G. Thickened gall-bladder containing gall-stones. D. Cystic-duct dilated and containing gall-stone. L. Lacing lobe. F. Lacing furrow.

infiltrated by it. After carefully examining the parts I looked for the gall-bladder but failed to find it, so the mass beneath the liver was still further investigated by lifting up the lobe of the liver covering it. The adhesions were easily torn through and some bleeding took place. Whilst separating the parts there was a gush of dark colored fluid and putting my fingers in the opening from where the fluid flowed I came upon a hard substance which I extracted with a pair of forceps. This proved to be two large gall-stones fused together and about the size of small wallnuts. Pushing my fingers still further into the cavity I felt a narrow orifice and behind this another cavity containing a large stone. This was extracted with difficulty by pushing it from behind by means of the fingers of the other hand passed beneath the liver.

No other stones could be felt in the direction of the common duct. The tumor bore not the slightest resemblance to a gall-bladder and looked more like a mass of new growth or inflammatory tissue in which were imbedded the stones and over which was liver and intestines. During these manipulations the peritoneal cavity had been guarded by sponges so no fluid escaped into it. The parts were irrigated by hot water and now the problem was how to attach this very much altered gall-bladder to the abdominal wall and to prevent escape of bile into the peritoneal cavity. The edges of the cavity which had contained the gall-stones were so friable that they could not be brought up to the abdominal wall. However, with a continuous silk suture, omentum was made use of in some places and portions of liver in others to fill in the space which existed between the wall of the abdomen and the edge of the altered gall-bladder, and at last with much difficulty the task was accomplished.

A red rubber drainage tube was introduced into the cavity past the constricted portion; over this was replaced the portion of liver which had been lifted up and then the abdominal incision was closed with half a dozen silkworm gut sutures, the drainage-tube protruding from the rear end of the wound. The wound was dressed with washed gauze and a pad of absorbent cotton. The patient rallied well from the operation, which had taken some time, and had no vomiting. There was some thirst and pain complained of the first 24 hours. The temperature was normal throughout and pulse never rose above 90.

Next morning, owing to the great discharge of bile, the dressing had to be changed and after this twice daily, the dressing being saturated with bile, immense quantities of which escaped. On the third day the tube was shortened, and on the fifth day the stitches and tube were removed and the wound was found completely healed except where the tube had been.

On the 9th day patient was up and dressed and moving about the room. The bile still continued to flow in large quantities at night only when on her side. Bowels were kept freely opened by salines and the stools although light-colored were not white. At the end of the second week the patient said she felt as well as ever she did and went out driving every day. The bile ceased to flow quite suddenly on the 15th day after operation. The sinus having completely healed up, a careful examination was made and no tumor could be felt nor was there any tenderness. She left for home on July 11, feeling perfectly well.

I have given this case in detail chiefly on account of the great difficulties there were in diagnosis. The case was a puzzling one even after the abdomen was opened, the gall-bladder being so altered as not to be easily recognizable. It was composed of a large mass of tissue the character of which could not with certainty be made out. To the naked eye it might have been new growth or inflammatory tissue. Portions of this tissue were removed and examined microscopically by Dr. W. Johnston, pathologist to McGill University, and pronounced by him to be composed entirely of inflammatory tissue. The elongated portion of the liver, above referred to, seemed to be entirely bloodless when cut into, in fact it was in a condition of cirrhosis, due no doubt to long continued pressure of the borders of the ribs on the right lobe of the liver from tight lacing, what has been called by Marchand a true lacing lobe being formed; the gall-bladder being entirely in this part of the right lobe the thinned portion of the liver is directly over the neck of the gall-bladder and cystic duct; this produces stagnation of the flow of bile and leads to its thickening and the formation of the gall-stones. My patient asserted she had never laced tightly. Still some pressure must have been exercised to cause the condition of liver found. The result of this case was most encouraging and points to the advantage of exploratory laparotomy in doubtful and even apparently hopeless cases.

EMPHYEMA OF GALL-BLADDER. CHOLECYSTOTOMY IN TWO STAGES WITH EVACUATION OF TWO PINTS OF PUS AND THREE GALL-STONES. RECOVERY.

By WEST HUGHES, M.D.,

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PIANO-TUNER, æt. 28 years, married; seen in consultation with Dr. DeSzigethy, Jan. 8, 1890. Family history good. No history of syphilis. About two years ago patient noticed a swelling, the size of an egg, in right hypochondriac region. Two or three months afterward there was a throbbing pain in it, which became so severe as to necessitate morphine injections for several days. He was confined to his bed for about two weeks, when the pain entirely ceased. Since then the swelling has grown slowly, but he has been free from pain. Close questioning elicits the fact that previous to two years ago he had had several attacks of abdominal "cramps" at intervals of four or five months. But the pain was never severe enough to confine him to bed, and he got well without medicine. He has never been jaundiced.

He now has an uneasy feeling in the abdomen and suffers slightly from dyspnoea on exertion. Bowels slightly constipated.

Examination. Patient is well nourished. In right hypochondriac region is a bulging tumor, the size of a child's head, having a tense, elastic feel, dull on percussion, freely movable in all directions except directly from the liver. Tumor dulness is continuous with dulness of liver over an area three inches wide.

January 8, 1890. An aspirating needle introduced and a small quantity of turbid fluid withdrawn, which, on settling over night in a test-tube, leaves a sediment one-third its volume. This sediment, under the microscope, is seen to consist of pus corpuscles in large number, granular cells and irregular masses of debris. No hooklets. The supernatant fluid is clear, transparent, of a light straw color, odorless, slightly alkaline, sp. gr. 1002. Gmelin's and Pettenkoter's tests for

bile negative. Urine clear, straw colored, acid, sp. gr. 1018. No albumen, no bile. Microscopical examination negative.

After the aspiration there was slight peritonitis, principally localized, lasting four days, during which time patient was kept in bed, under the influence of morphine.

February 9. Tumor has apparently increased in size and is slightly painful (probably due to repeated manipulation, as, without my knowledge, patient was examined by a number of physicians).

Operation. Ether. Assisted by Dr. Powers and Dr. Brill. Skin incision 3 inches in length, beginning at free border of ribs, $\frac{1}{2}$ inch to outer side of rectus; and extending downward and slightly inward over the centre of tumor. All bleeding points clamped and tied. Parietal peritoneum, which was normal, was lifted with forceps, and divided with scissors for $1\frac{1}{2}$ inches. Tumor freely moveable with respiration. Visceral peritoneum covering it deeply congested.

Incision packed with iodoform gauze and a strongly antiseptic dressing (wet bichloride 1-500) applied. Administered hypodermic of morphine gr. $\frac{1}{4}$.

February 16. At 8 A.M. the day after the operation temperature was 100°. At 8 P.M. temperature was normal. Respiration has been entirely thoracic. To prevent motion of diaphragm, urine has been drawn with a catheter, which is kept in 1-40 solution of carbolic acid, and bowels have been kept from moving by morphine, gr. $\frac{1}{6}$, t. i. d. To-day morphine discontinued. Ordered glycerine suppository.

February 23. Bowels have moved daily since last note. Patient etherized and dressing removed. Discharge not through. No odor of decomposition. Wound, which had closed, was opened up with director. Tumor found adherent for two-thirds of circumference of wound above and to the inner side. To outer side and below, finger passed freely between abdominal wall and tumor.

Lower and outer edges of wound stitched to tumor with catgut. Iodoform gauze packed tightly into wound. Antiseptic bichloride dressing.

March 2. The day following last operation temperature was 101°; since then it has varied between 99° and 100°. Patient has a painful cough, and spits up mucus streaked with blood. Bowels have moved daily, with little pain.

Dressing removed under chloroform, which was chosen on account of condition of lungs. Discharge slight. No decomposition. Adhesions around edges of wound complete.

Free incision made into tumor, and two pints of odorless pus evac-

uated. Probe passed into cavity upward and inward 8 inches. Tumor wall $\frac{1}{4}$ inch thick. Two fingers passed within and cavity explored. Internal surface has a soft, velvety, villous feel. No foreign bodies detected; but exploration was not thorough, for fear of breaking up adhesions.

Cavity washed out with boiled water, and two rubber drainage tubes inserted a depth of 5 inches. Iodoform gauze and wet bichloride dressing.

March 10 Temperature, pulse and respiration have been normal since operation, and patient has had a ravenous appetite.

Cavity has been washed out daily with 1-30000 bichloride, and has contracted to one-third its former size. The discharge is now a clear, colorless, thick, gelatinous mucus, free from odor, about a teaspoonful daily.

Finger introduced upward and inward its full length touches a hard body quite firmly imbedded. It was removed with difficulty, and found to be a gall stone, with facets. Two others removed, each about the size of a hazelnut.

March 15. Several subsequent explorations fail to detect any more stones.

Finger can be introduced its full length along a funnel-shaped cavity, with mouth toward abdominal wound. Alligator urethral forceps introduced a distance of 8 inches, till extremity is grasped tightly in cystic duct.

Patient allowed to sit up and walk about the room. About 10 days afterward the dressing became stained with bile, for the first time, when the drainage tubes were removed and wound allowed to close. He left the city shortly afterward, but informed me by letter (dated May 11), that the wound was all but closed, and there was scarcely any discharge.

There are several points about this case worthy of special note. It is remarkable that such a quantity of pus should have given rise to no constitutional disturbance; also that, notwithstanding the inflammation which must have preceded the suppuration, there were absolutely no adhesions between the parietal peritoneum and that covering tumor. The extraordinary thickness of the tumor wall ($\frac{1}{4}$ inch) is also worth remarking. In simple distended gall-bladder the wall is very thin.

The very long time (two weeks) between the first and second operation will probably be commented on. Propositions were made to operate a week sooner, but the weather was damp and cold, and there were no means of heating the room except a small gas stove. The hygienic surroundings were bad enough, and I was anxious not to make them worse. On account of the surroundings, after performing the operation as antiseptically as possible, an unusually strong bichloride dressing (1-500, freshly prepared) was applied, the skin being protected with rubber tissues soaked in 1-5000 bichloride.

At the first operation, after opening the peritoneal cavity, the gall-bladder was not sutured to the edges of the wound, because on account of its size and bulging, it was not possible for any other object to present at the wound and become adherent. Suturing was thought to be entirely superfluous; it was believed that firm adhesions could be secured by packing the wound with iodoform gauze. Failure to secure this result was due to the fact that the strip of gauze was in some way pushed up out of the opening in the peritoneal cavity which then entirely closed. If the operation had not been performed antiseptically, and such a strong antiseptic dressing applied, adhesions would probably have been firm enough.

At the second operation, after suturing the non-adherent edges of the wound to the tumor, the operation could probably have been completed with safety. But it was thought that a further delay would give the patient more chances of recovery.

About 80 cases of cholecystotomy have been reported, more than half of them by Lawson Tait, who considers the operation a very trivial affair. But, so far as I can ascertain, there have been only two other cases of a non-adherent, suppurating tumor of the gall-bladder successfully operated upon. There have been several such cases operated upon with fatal result, death being caused by suppurative peritonitis, due to the entrance of the contents of the gall-bladder into the peritoneal cavity. It would seem far better to operate in two stages, when this danger can be entirely eliminated.

In empyemic distention the walls of the gall-bladder are

thickened, non-elastic, and somewhat friable. It would be a difficult proceeding to evacuate the contents through a trochar or by aspiration, enlarge its opening and suture its edges to the wound, without allowing some of the fluid to escape into the peritoneal cavity. In simple distention, the walls being thin and elastic, there would be no necessity of performing the operation in two stages. In such cases the opening in the gall-bladder and the abdominal wound may be sutured separately, the gall-bladder being returned to the abdominal cavity. But a simpler and safer operation (Tait) is to suture the edges of the bladder opening to the edges of the wound and insert a drainage tube into the bladder. At the end of a few days the tube can be removed. Then if the obstruction has been entirely relieved, the fistula will readily heal. If the obstruction still exists (and of this the operator can never be absolutely sure at the time of operation) even if the fistula should close and the distention recur, the wound could be torn open with the finger or with some blunt instrument, without the administration of an anæsthetic. But if the gall-bladder should have been sutured separately, then in case of a recurrence another operation would be necessary. The indication that there was no longer any obstruction in my case was the escape of bile from the fistula, the contents of the gall-bladder at the time of operation being entirely free from bile. Of course there never was any obstruction in the common duct, since there was never any jaundice.

EDITORIAL ARTICLES.

BERGMANN ON THE SURGICAL TREATMENT OF DISEASES OF THE BRAIN.

The first edition of Prof. von Bergmann's work on the Surgical Treatment of Diseases of the Brain, being a contribution from his Berlin Klinik in 1887, was reviewed in the ANNALS OF SURGERY, of April, 1888. In that edition the subject of deep cerebral abscesses, tumors and epilepsy alone received attention. In a second edition, issued in 1889, from the press of Hirschwald, of Berlin, two new chapters are added, dealing with congenital diseases of the brain, and intracranial pressure. These chapters are reviewed at length by Dr. SALZER, in *Wiener klin. Wochenschrift*, 1889, II, Nos 40 and 41, from which we take the following:

The operative treatment of encephalocele.—Bergmann opposes the nearly general view of the more favorable prognosis in the operative treatment of meningocele compared with that of encephalocele. First presenting the pathologico anatomical characteristics of the sincipital forms of cephaloceles (1, naso-frontal; 2, ethmoidal; 3, naso orbital) and proving that hydrencephalocele and cenencephalocele are more frequent than pure meningocele, he treats especially of cenencephalocele, for which he had very successfully operated in one case. These constitute the largest number of these tumors on the forehead, are of small size with a broad base or only indistinctly pediculated, feel lax, at least not tense, to the touch, are mostly pulsating and become tender on the child's crying. The skin, covering them, is frequently cicatricial and teleangiectatic.

Operation is especially justifiable, as children with sincipital encephalocele live longer, on an average, than those with occipital ones, and on the other hand the thinness of the general covering of the enceph

alocele very much endangers the condition of the patient. This class of encephalocele are all laterally situated, and only in a large osseous interspace is a median position simulated. The protruding brain substance always belongs to the extremitas frontalis of the corresponding hemisphere; that is, to a region which may be lost without producing any ill effects on the functions of the brain. On the basis of his investigations Bergmann advocates a radical operation, especially for sincipital encephalocele, by means of the extirpation of the entire protruding sac together with its contents. He believes that encephalocele offers a better prognosis than hydrencephalocele, as just with the latter the danger of a hydrocephalus internus is much greater.

As to the different varieties of occipital encephalocele, operative aid is only to be thought of in pure meningocele and the laterally situated occipital encephalocele. These superior occipital cephaloceles probably have a course of development similar to that of the sincipital varieties, and only as a distinction from those may, more frequently, be hydrencephaloces and thus on account of the danger of the increasing hydrocephalus yield a more unfavorable prognosis. They may become especially dangerous to the patient also for the reason of the dura mater being often lacking over them (de Ruyter) and as the angiomatous skin adheres directly to the arachnoid and pia mater, which also explains the importance of even the slightest injury.

The opening of deep cerebral abscesses is treated in the second chapter. In this Bergmann again emphasizes his conviction that deep cerebral abscesses always will have a lethal issue, by breaking through into the ventricular or meningeal spaces and, therefore, they must be evacuated. The diagnosis is especially supported by the knowledge of the ætiology of cerebral abscesses (open wounds in the skull, other suppurative processes within the skull, chiefly diseases of the ear, metastatic and tuberculous abscesses of the brain). He speaks this time especially against the occurrence of idiopathic abscesses of the brain.

In speaking of the difficulties connected with the diagnosis of metastatic and tuberculous cerebral abscesses, a recent case operated upon by Drummond is quoted, in which the metastatic abscess had developed in the middle frontal convolution after a pulmonary affec-

tion. Bergmann thinks that tuberculous abscesses of the brain are not radically curable, because the tuberculously diseased walls of the abscess can not be removed. He believes operation to be successful only in abscesses caused by traumatism, suppurative processes of the ear, or such of the bones of the head.

In the consideration of the diagnosis of the ætiologically different abscesses he emphasizes, especially in regard to abscesses following affections of the ear, that attention must be paid to the chronicity of the preceding disease, but at the same time he calls attention to the fact that they may also occur after acute suppurative processes of the middle ear.

In regard to the development of cerebral abscesses after suppuration of bone the author mentions as a favorable factor for this process pachymeningitis externa purulenta, which process is observed from extension by continuity of suppuration of bone into the cranial cavity. In the consideration of the fact, that also in such cases (as in otitis media) the abscesses are found within the white substance, separated from the ear by layers of healthy brain-tissue, he presents the following hypothesis for the explanation of the development of isolated cerebral abscesses: the extension of pus along a sinus leads to its thrombosis, and the thrombus in the sinus to organization; in the small veins of the brain the thrombus undergoes necrosis and thus a periphlebitic intra-cerebral abscess is formed.

The clinical cases speak for the frequent occurrence of abscesses in the temporal lobe in affections of the upper surface of the petrous portion of the temporal bone, and for abscesses of the cerebellum in suppuration of the mastoid process, which circumstance will also form a support for localization.

Everything which aids stagnation of inflammatory products in ear affections, especially of the upper part of the cavum tympani, favors also the breaking through of pus into the dural space, as well as the appearance of leptomeningitis purulenta, the formation of thrombosis of the sinuses and deep cerebral abscesses.

In considering cerebral abscesses the following divisions are made:

1. The symptoms of the suppuration itself.
2. The symptoms of the increased intra-cranial pressure.
3. The symptoms of the focus.

Bergmann quotes a new example of an operatively cured cerebral abscess, after long-lasting suppuration and retention of pus at the place of fracture of the left parietal bone (case of Morini Vicenzio, 1887). Abscesses which have developed without symptoms have been several times operated upon too late, *i. e.*, after penetration into the lateral ventricles had taken place; even here temporary improvement of the general state has been observed. A case observed in 1888 in the Berlin clinic illustrates distinctly how quickly in abscesses of the temporal lobe the latent stage passes into the terminal stage.

Of the 8 cases of deep abscess of the brain, which have been operated on successfully, Bergmann mentions first his own very typical observation:

October 14, 1888.—A man, *æt.* 29 years, had suffered for a year from a purulent discharge from the right ear; during the last three weeks he also had suffered from vertigo and staggering gait, and within the last four days violent headaches, chiefly right-sided, set in. High fever (39.5° C.) was present, the quantity of the discharge at the same time diminishing. No signs of inflammation could be discovered around the mastoid process, but the superior wall of the auditory canal was swollen in its posterior portion and pus retained in the upper part of the tympanic cavity. The pain was increased by percussion of the temporal lobe above the concha. The exhaustion and torpidity of the patient, together with striking decrease of the pulse (44 per minute), besides the above mentioned symptoms, indicated increased pressure upon the brain.

Disturbances of motility and sensibility in the left upper extremity were especially signs of increased pressure in the neighborhood of the temporal lobe.

Diagnosis: Abscess in the temporal lobe. Operation was decided upon without hesitation.

For limiting the field, within which the cranium should be opened to expose an abscess of the temporal lobe, Bergmann gives the following rules:

A line is drawn about 5 cm. above the arcus zygomaticus parallel to it, the arch being easily felt in the living subject. The upper border

having been thus marked out, the posterior may be found in a similarly simple way. A basal line is drawn, *i. e.*, a line connecting the lower border of the orbit with the tuber occipitale, as well as a vertical one to the sagittal suture, which should take its origin from the posterior border of the mastoid process; this represents the desired posterior border. The anterior corresponds to a line running parallel to it through the inferior maxillary articulation. Now, care is to be taken that the lower border of the perforation in trephining be kept at a distance of at least one cm. from the root of the zygomatic arch, which runs over the meatus auditorius externus.

The author trephined in this case above the posterior border at the base of the processus mastoideus, struck at first healthy dura mater and then oedematous brain substance. "The knife was thrust in three times before it reached the abscess, which was situated anteriorly to the incision. A greenish-yellowish, fetid pus was evacuated. The quantity of it amounted to about 30 c. cm. Digital examination revealed a cavity with smooth walls, surrounded on all sides by soft masses. Iodoform-ether was carefully, and with the slightest pressure, injected into the cavity, and then a drainage tube was inserted 4 cm. into the wound. Around the drainage tube the cerebral wound was loosely packed with iodoform gauze, which was also put into the bone-wound, as well as into that of the soft parts."

The fever decreased, the pulse rose and the headache also disappeared immediately after the operation. The patient was cured after six weeks, except the secretion from the ear. For the latter he was again operated on in December, and made a perfect recovery.

The histories of 7 other deep cerebral abscesses which have been cured are quoted (Schede, 1; Barker, 2; Greenfield, 1; Macewen, 2; Horsley, 1). Of special interest is the case of Horsley, as it presented very alarming symptoms. Horsley operated on the patient (male, æt. 45 years), evacuated the abscess, and three weeks after the operation the patient was cured in every respect.

In regard to these 8 cases, Bergmann emphasizes the symptom of the early constant "raging headache," with localization by means of percussion above the upper border of the concha, as well as combina-

tion of the symptoms in order to localize the abscess. He also calls attention to the vacillation in the intensity of the symptoms, the fever and cerebral pressure.

"The lower extremities were never involved in the corresponding cases, which shows that the lower portions of the central convolutions were affected. That is the fact which indicates a compressive and narrowing disturbance extending from below upward, an unequal conduction of the pressure through the solid mass of the brain, which influenced the structures near the abscess in the temporal lobe more than the more remote ones. In collection of pus between the bony skull and the dura mater the mentioned general and limited phenomena of pressure have not been observed."

As examples of such successfully operated cases the author mentions those of Schondorff, Hoffman and Ceci. The case of Ceci, the only example of successful opening of the cranium in cerebellar abscess, shows the interesting symptom of disturbance of locomotion, viz., the patient staggered like a drunken man, and in walking had to support himself by the wall. The abscess was situated closely to the wall of the sinus transversus.

"A large number of the extra dural abscesses in the cranium are undoubtedly of a periphlebitic origin. This should, however, be no reason for failing to evacuate them. We possess, on the contrary, a number of reliable communications, from which we can see that thrombosis of the sinus transversus has been rendered innocuous by removal of the pus, which had rested against the vein." In speaking of the technique of trephining, Bergmann accepts the proposition of Baker, *i. e.*, the exposure of the emissarium in the sutura occipito mastoidea, if any doubt as to the location of the abscess be present, for suppuration near the anastomosing vein indicates a suppurative process in the posterior cranial fossa. He advocates the use of the knife instead of the exploring needle, demonstrating the safety of simple incision of the brain substance, as has been shown by experiments and clinical experience.

At the end of the chapter the author considers the prophylactic treatment of cerebral abscesses, more especially that of suppurative

processes of the ear, warning energetically against the too frequently practiced injections in modern aural therapeutics, and recommends instead drainage and rest. The procedure for erosion and securing of sufficient drainage recommended by him is as follows: A crescentic incision is made around the external ear, concentric to the antihelix, but $\frac{3}{4}$ -in. removed from it. The incision is carried down to the external surface and mastoid portion of the temporal bone. The periosteum is pushed upward and backward toward the external auditory canal in such a way as to entirely expose the edges of the canal. Closely beneath the transverse ridge of the root of the processus zygomaticus chips of bone are carefully cut off with a sharp chisel, until by removal of the superior and posterior wall, a funnel-shaped opening is formed, which would admit a finger into the tympanic cavity.

3. *Operative treatment of tumors of the brain.*—Two varieties of cerebral tumors are to be distinguished: 1, circumscribed, and 2, infiltrated tumors. The successful extirpation of tumors having their origin in the roof of the cranium has proved that large pieces of the cranium may be removed without ill consequences; moreover, if the defect be immediately repaired by dermoplasty. Syphiloma of the brain should never be treated operatively, even if it excites all the phenomena of a cerebral tumor, because, first, internal therapy is sufficient, and second, even extirpation of the resulting scar after disappearance of the syphilitic manifestations, does, probably, not yield a more favorable condition on the surface of the brain.

Macewen extirpated successfully a tumor (in a case of brachio-cranial hæmiplegia), which, probably, is to be regarded as a syphiloma of the cortex.

Tuberculoma is not a favorable object for surgical treatment, on account of its rare occurrence as a primary tuberculous focus and also because a radical cure seems only attainable by extensive excision in an otherwise healthy subject. Of the four cases of extirpation of localized cerebral tuberculosis, two of them, operated upon by Horsley and Macewen, were, however, cured. In both of these cases the tuberculous process in the cerebral cortex had excited cortical epilepsy. Horsley, who performed extirpation in a subject otherwise healthy, ob-

served in his patient permanent paralysis of the fingers. Macewen, who did not remove the tubercle of the pia mater, but only enucleated the tubercle found in the central convolution (the tubercle having the size of a hazelnut), does not report any paralytic phenomena. The two fatal cases of tuberculosis of the cerebellum, on the other hand, illustrate the difficulties presented in successful operation for evacuation of tuberculous masses from the brain.

The analysis of White's cases results in that among 100 tumors of the brain only 9 are operable; but these are mostly of slight clinical importance, because diagnosis is only possible if they are situated in the motor region, or in the occipital or temporal lobe, and of a certain size. Infiltrated tumors should not be extirpated, as the outlines cannot be distinguished. Large cerebral tumors should also not be removed, on account of the alarming hæmorrhage, which is likely to follow and difficult to check, and the development of extensive œdema of the brain. Macewen and Durante extirpated successfully one tumor each, which had compressed the frontal lobe.

Tumors of the brain-substance, which were diagnosticated only from the cerebral symptoms, were extirpated by Bennett and Godlee (1884), Hirschfelder (1885), Horsley (1886, each tumor weighing $4\frac{1}{2}$ ounces), Keen (1887), Seguin and Weir (1887); of these, three cases had remained well, at least three months after the operation. The cases in which operation was performed under false diagnosis, or those in which the tumor was not found at all, or where the operation could not be carried out on account of the large size of the tumor or complicating adhesions, are not enumerated. Bergmann operated once under false diagnosis, a cyst, the residue of an apoplectic focus, being in question. The patient died four weeks after the operation from leptomeningitis.

The author is of the opinion that operation for tumors of the brain is to be limited to a few cases where the diagnosis can be made with certainty.

4. *The cure of epilepsy by trepanation.*—"The present statistics on the success of trepanation in the treatment of this disease are valueless, as the cure of the wound caused by the operation is only mentioned, and not the cure of epilepsy, thus not considering the essential

feature of this therapeutic measure. The reason of this is chiefly to be sought for in the premature publications of the different operators "

Bergmann obtained a successful cure of reflex-epilepsy in one case by extirpating a scar on the thigh. Cases of epilepsy, which follow head-injuries, are not to be taken in general, as reflex epilepsy, even if it may occur frequently, simply because in non-fatal injuries of the head epilepsy occurs in 0.57% of the cases, while, on the other hand, in injuries of the neck, trunk and extremity together, epilepsy occurs only in 0.076% of the cases.

Traumatic epilepsy after injuries of the head is undoubtedly to be regarded, as a rule, as cortical epilepsy, and appears frequently as a distinct picture of Jacksonian epilepsy.

Horsley, led by the conviction that the pathological process, which especially gives rise to the epilepsy, is to be sought for in the cortex, extirpated that part of the latter which was diagnosed as being diseased, from the symptoms presenting themselves in a patient. He really found a pathological change in the extirpated portion of the cortex and also cured the epilepsy.

Horsley further removed in three other cases portions of the cortex with the scar or traumatic cyst beneath the dura, and, in latter years, analogous operations have been successfully performed by others.

The successful excision of portions of the cortex in traumatic epilepsy led to the excision of areas of the cortex in non-traumatic cases, in which the epilepsy could be located. But in Bergmann's case, as well as in that of Horsley, who had extirpated a certain psychomotor centre, the character of the epilepsy was not essentially influenced. The success in the recent case of Keen is also to be regarded as incomplete.

Operation for epileptiform attacks of vertigo and periodically occurring mental disturbances, appearing after traumatism, should not be performed on account of the absence of localization of the disturbance.

Bergmann emphasizes the difference and distinction between those cases which present a complete and pure picture of traumatic cortical epilepsy and those which do not present the essential characteristics of this affection. He then gives, in extenso, the different groups of

symptoms which characterize each of these affections, and concludes by saying: "We should endeavor to give our surgical aid only to cases of pure traumatic cortical epilepsy."

5. *Puncture of the ventricles and operations for removal of pressure.*—After mentioning the rare case of Ceci, in which (a case of pachymeningitis chronica hæmorrhagica) the latter trephined successfully, and that in which Bergmann himself operated, on account of fixed and distinctly located headache, and where he effected a cure by removal of a blood extravasation, located beneath the extremely thin vault of the skull, he treats of the influence of operation upon increased cerebral pressure in tumors of the brain, as well as in ventricular dropsy, as a sequel of tuberculous basilar meningitis.

In a case of large cerebral tumor, Heath caused, by simple trephining (extirpation of the tumor being impossible), cessation of the headaches, the epileptic attacks and disappearance of the paralysis. The tumor, which originated in the anterior fossa, and was adherent to the bone, had thus opportunity to protrude from the cranial cavity.

Bergmann doubts very much whether the intra-cranial pressure, which might be present in subdural tumors, or, moreover, in subdural blood extravasation, *e. g.*, in hæmorrhages into the substance of the brain produced by diseases of the arteries of the brain, could ever be decreased by trepanation.

The author undertook operation in a case of hydrocephalus acutus in tuberculous meningitis. While demonstrating that the immediate danger lies here in the inflammation of the plexus and its product, *i. e.*, exudation of fluid with consequent increase of the endocranial tension, he, at the same time, refers to the possibility of a favorable influence upon the tubercular process itself through the removal of the transudate, reminding one of the analogous and sometimes successful treatment of tuberculous peritonitis.

He made, in a child, æt. 3 years, which already was in a soporific state, and had intermittent, retarded pulse; an opening over the tuber ossis frontalis by trephining, and then inserted a long, hollow needle deeply into the brain, until the cerebro spinal fluid flowed out in a jet. After removal of the needle the defect in the skull was tamponed with

iodoform gauze. A striking improvement of the respiration and heart's action set in, and the child took food of its own accord. Exitus letalis took place on the fourth day; cerebro spinal fluid had dribbled away all the time. The immediately desired decrease of the intracranial pressure was, however, accomplished.

ALBERT PICK.

INDEX OF SURGICAL PROGRESS.

GENERAL SURGERY.

I. Experiments on the Transmissibility of Carcinoma and Sarcoma. By DR. TILANUS Jr. (Holland). The author transplanted pieces of carcinoma and sarcoma of different sizes, not larger than a pea, into the abdominal cavity of white rats. He then vaccinated from these ones other rats; at first daily and later on every second day. Within the first few weeks the majority of the tumors increased in size, but then again decreased in circumference. The pieces lay freely in the abdominal cavity, connected only by means of a single band with the mesentery. Microscopically examined they were found to consist of connective tissue, in layers, not having any longer the characteristics of carcinomatous or sarcomatous tissue; the nucleus consisting chiefly of detritus. In a few cases larger tumors developed after several months, which were also only connected by solitary bands with the mesentery and contained pus. The latter was introduced into the abdominal cavity of other rats and resulted after the lapse of about twelve days in the development of similar pus—containing suspended corpuscles. Inoculation on agar yielded cultures, which, on microscopic examination, were seen to contain cocci. According to these experiments Tilanus did not succeed in transmitting carcinoma or sarcoma by inoculation.—*Weekbl. van het Nederl. Tijdschr. voor Geneesk.*, 1889, ii.; No. 22.

II. On Bromide of Ethyl Narcosis. By DR. HADERUP (Denmark). The results of his experiments made in the clinic with bromide of ethyl as an anæsthetic were given by Haderup in a lecture before the Copenhagen Medical Society.

The speaker had used, in the course of about a year, this anæsthetic

in one hundred cases and found it excellent in operations of short duration. It is easily used, free from danger and without any disagreeable after-action; but one must be sure and have a good preparation, as for example *Merck's*. It is quite inexpensive. The speaker only has induced *primary narcosis*, i. e., he has only given it until anæsthesia was produced and then removed it. In all patients with heart and lung diseases it is contraindicated; one patient with acute bronchitis was experimented with to see its action on the pulmonary mucous membrane, which, however, in this case was negative. All the operations were extraction of teeth; in most of the cases two, three and once eleven teeth were extracted. In no case did the patient feel anything. The dose for adults has as a rule been eleven to twelve grammes, which is inspired at one time. Esmarch's mask was used with a double cover, however, and indeed it must be so tight as to allow but little atmospheric air to get in. The speaker described in detail fifty cases of narcotization; six men, thirty-six women and eight children. This anæsthetic acts especially well in children. It induces nausea and vomiting, but less so than chloroform; it seems as though the time of the last meal had but little influence. In not a few cases excitation was noticed, but it was as a rule only slight. Nothing is said by the speaker on its influence upon the pulse. The pupils dilate according to the profoundness of the narcosis; in one case only were they contracted. Narcosis appeared, on an average, in children after thirty-two, in adults after forty-six seconds; it lasted in the former one, in the latter one and a half minutes, but the analgesia may last somewhat longer. The general condition rights itself a few minutes after; but not rarely the patients have nausea and vomiting after awakening. A little vertigo is very frequent, lasting, however, only a few minutes. This drug may, of course, be used in other minor surgical operations. Anæsthesia may be prolonged to ten and fifteen minutes, or the patient may be allowed to awaken and then be narcotized at once again. If anæsthesia be prolonged beyond ten and fifteen minutes narcosis does not apparently continue, the patient becomes restless and the painful sensations seem to return. Bromide of ethyl has the advantage over chloroform of being less dangerous; over ether of being less in-

flammable as in operations where illumination or thermo cantery is used. In the discussion which followed Dr. H.'s lecture, Dr. Engelsen states that in very nervous patients he has gotten poor results as only an alleviation of pain, but no freedom from pain was produced. The patients also have a very badly smelling breath for several days after narcotization. The muscles become only very slightly relaxed. Dr. Wm. Meyer has used bromide of ethyl narcosis in a small number of operations on the pharynx and ear, in children as well as in adults; in adults it was given while sitting, in children while lying. He used five to twenty grammes of the drug and as a rule induced only primary narcosis, which made its appearance after one half and five minutes. None of the operations lasted over four minutes and during that time there was always analgesia; in aural operations the narcosis was often continued during the operation. He has seen excitation more frequently and it has been longer lasting than in Haderup's cases; but movements, cries, etc., should not hinder one to begin or continue the operation, as nevertheless there is analgesia. When the arm falls down without resistance, analgesia was always complete. Disagreeable consequences were seen very rarely; once apnœa was remarked, The cyanosis of the face is quite distinct. He has seen more disagreeable after-effects than Haderup. The patients awaken quickly; but in about onethird of the adults there followed partly a sense of weight in the the extremities, partly vertigo, and sometimes nausea. As a rule these effects soon pass away, but not always; for in one patient there was headache lasting one day; in a second patient it lasted two days and several were unable to go home alone. In children the after-action is less. In a child with very large adenoid vegetations a very violent hæmorrhage took place from the nose, but this ceased the moment the child was raised up. In many cases everything goes on smoothly and the remedy, in general, is excessively pleasant to administer and is to be recommended in private practice, as one may get on without an assistant. Dr. Haderup observed that also in every nervous woman he was always able to produce narcosis; he has heard no complaint of badly smelling breath. He also mentions the want of muscular relaxation, seen, for example, if one will introduce a wedge between the

teeth. He has also seen one case of apnœa. He has never had the patients complain of a sensation of cold, nor seen any sign of irritation of the mucous membrane of the air passages.—*Bibliotek for Læger*, R. 7, Bd. 1.

F. H. PRITCHARD (Boston).

III. The Transplantation of Skin From Dead Body to Granulating Surface. By DR. SOPHIA S. IVANOVA (St. Petersburg, Russia). In the *Wiener Medizinische Blätter*, August 8, 1888, Drs. Bertens and Werner published a remarkable case of a boy, æt. 14 years, with intractable extensive ulcers of the legs, in which they had successfully transplanted 24 skin grafts (1 or 2x1 centimetres) excised from the body of an old woman (æt. 75 years) about 20 minutes after her death. The perusal of the author's paper induced Dr. Ivanova to try their method in the case of a poorly-nourished woman, æt. 75 years, who had received a burn of the third degree involving the whole leg and dorsal aspect of the foot. In about a fortnight the injured integuments sloughed away to leave an enormous freely suppurating granulating surface. The grafting (resorted to shortly after the separation of the sloughs) was made at two sittings, with the interval of $3\frac{1}{2}$ weeks, the material being derived from two new born infants' bodies, $1\frac{1}{2}$ and 2 hours after the children's death. During a short period elapsing between the excision and transplantation, the strips and pieces (of varying size) were kept in a 0.6% solution of chloride of sodium at 40° C. Every one and all of them became firmly adherent to the surface in 48 hours, while in 2 or 3 days the epidermis began to grow around all the grafts. Speedy and sound healing ensued. The author believes that the following conclusions are justified by her case and that of the said German authors.

1. The method offers undoubted advantages over Reverdin's plan in *a*, its securing an "incomparably more rapid" healing of lesions and hence very substantially lessening injurious effects of prolonged suppuration and lying in bed; *b*, its giving much better functional results (through preventing cicatricial contraction, etc.); *c*, the material is easily obtainable in abundance, and that without inflicting suffering or incon-

venience to any human being. 2. The skin must be taken always from bodies of such patients who have not had syphilis, septicæmia or any other infectious disease. 3. The best material is afforded by bodies of new born infants of healthy mothers, the infantile tissue possessing most energetic vitality. 4. It is advisable to employ rather long strips measuring not more than 2 or 3 centimetres in width. Small-sized pieces are easily washed away by pus or blood. 5. Only the skin proper, freed from all subcutaneous cellular tissue, should be transplanted. 6. Be the granulating surface clean and non-atonic, no scraping is necessary. It is fully sufficient to previously thoroughly wash out the surface, after which the grafts should be carefully adjusted and slightly pressed down with dressing. 7. The best dressing material is gauze soaked in a boracic acid solution and then wrung out. The tissue absorbs secretions very well, never becomes adherent to grafts, and hence may be easily removed without disturbing the latter. 8. The transplantation must be practiced as early as possible. Thus, in cases of deep burns it should be resorted to immediately after the separation of sloughs. When large-sized strips or pieces are used, even a free suppuration cannot prevent their adhering to the surface. —*Khirurgitchesky Vestnik*, June, 1890, p. 377.

VALERIUS IDELSON (Berne).

NERVOUS AND VASCULAR SYSTEMS.

I. Operative Interference in Spondylitic Paralysis. By PROF. KRASKE (Freiburg). Kraske reported four cases in which he had opened the spinal canal and removed tubercular formations pressing upon the cord. The paralysis in all cases was complete and the bladder and rectum were affected. In one case there was caries of the vertebral arches with abscess of the back, in the other the tubercular process started from the neck of a rib, resulting in abscess upon the back and involvement of the nerve roots in the spinal canal. In the other two cases there was the ordinary spondylitis of the body of the vertebræ with deformity. In most of these cases we must be content with removing the compressing growth or formations but the operation will hardly be more than palliative. In most cases it is impossible

to remove the entire focus of disease. We gain enough if we restore the paralyzed limbs to function and improve the nutrition of the patient. Again, by the operative interference we remove several laminæ and spines of vertebræ in that part of the spine where support is most needed. It can be seen that the curvature of the spine may thus be greatly increased and a new source of injury to the cord introduced. These unfavorable results may be in a measure prevented by appropriate position of the patient and a regeneration of the removed bony parts in some cases results. Inasmuch as in these cases the dura is not involved and in operating it is not necessary to lay open the dura, the operation may be looked upon as one devoid of danger. If the bladder and rectum be involved the operation is certainly justifiable upon, no other ground than the relief of the patient's helpless condition. Kraske has operated in the well-known manner. The fungous granulations were removed from the surface of the dura, to which they adhered, with scissors and forceps. In three cases the granulations were partly disintegrated and suppurating; in one case there was an abscess with about 5ij of pus in the spinal canal. In one case a man, æt. 33 years, who died eight weeks after operation, the result was unsatisfactory, it was shown that though the laminæ had been resected, the whole of the fungus had not been removed. The pulsation of the cord did not return as in the other 3 cases after operation. In the remaining 3 cases the results were very satisfactory. The cases in which operation is indicated are mostly those of caries of the laminæ of the vertebræ with consequent abscess and compression. Caution is to be used in selection of cases.

Every possible means of treatment should be tried before resorting to operation. Operation is then only resorted to when compression of the cord by a growth outside the dura can be diagnosed with moderate certainty.—*Beilage zum Centblt. f. Chir.*, No. 25, 1890.

HENRY KOPLIK (New York).

II. Popliteal Aneurism Cured by Prolonged Digital Compression. By MR. RIVINGTON (London). A male, æt. 43 years, who had not suffered from rheumatism, syphilis or gonorrhœa,

but who was in a bad physical condition from the excessive use of liquor, presented a well developed aneurism in the left popliteal space. His heart was much enlarged and the arteries were rough and hard while the aorta was dilated. The femoral artery pulsated very forcibly and appeared to have undergone pathological changes. For these reasons it was decided to avoid ligature of the femoral if possible. Accordingly, digital compression of the artery was tried extending over a period of about two months, as follows:

December 9,	Digital	Compression	for	-	-	-	27 $\frac{1}{2}$	hours.
" 13,	"	"	"	-	-	-	27	"
" 18,	Tourniquet	"	"	-	-	-	10	"
January 30,	Digital	"	"	-	-	-	48	"
February 3,	"	"	"	-	-	-	24	"
" 5,	"	"	"	-	-	-	12	"
" 6,	"	"	"	-	-	-	36	"
<hr/>								
Total,	-	-	-	-	-	-	184 $\frac{1}{2}$	hours.

More than fifty students participated in the compression. On December 10, an abrasion appeared at the point of pressure, which did not heal until the latter part of the month, and necessitated a suspension of the compression until the end of the latter month. Meanwhile the leg was kept flexed and a pad applied over the aneurism in the popliteal space from January 1 until the sore healed, when the digital pressure was resumed, a fourteen-pound weight being applied to the fingers; the skin broke down however under this and the weight had to be discarded and the artery compressed above and below this point. Pulsation ceased six hours before the pressure was removed. A day or two later the patient was up and walking about and a complete cure was obtained.—*Lancet*, May 3, 1890.

JAMES E. PILCHER (U. S. Army.)

III. Suture of the Arteries. By ALEXANDER JASSINOWSKY (Dorpat, Inaugural dissertation Dorpat 1889). The writer, after a historical review of attempts at suture of arteries, calls attention to the fact that all experiments up to now in closing wounds of the arteries

have been quite negative, for in not a single case was permeability of the vessel to be obtained. That small punctured wounds of arteries do heal is known, and hence in imitating nature one should endeavor to follow this same process; and this is attained in the arterial suture. His conclusions based upon numerous animal experiments are as follows.

1. Suture of the arteries induces healing of the wound of the vessel by first intention.

2. Hæmorrhage may be entirely avoided after the operation.

3. In the further course of the wound neither secondary hæmorrhage, obstructive thrombus, nor the formation of aneurysms is to be feared.

4. Suture of the arteries is indicated in recent and clean longitudinal, oblique and flap-shaped wounds in large vessels which involve not more than half of the circumference of the latter.

5. The strictest antisepsis is a *sine qua non* of suture of the arteries:

6. Suture of the arteries is easily carried out.

The operative procedure is as follows: The vessel is occluded by pressure; the arterial wall is laid bare at the place of suture and the arterial sheath pushed back. Then sutures are introduced through the tunica adventitia and media which are fastened by a double knot and the ends of the sutures clipped off. The vessel sheath, fasciæ and skin are also sutured after lessening somewhat the pressure and the entire wound is covered with photoxyline.

F. H. PRITCHARD (Boston).

HEAD AND NECK.

I. Foreign Body in the Frontal Sinus. By DR. NIKOLAI N. ESAULOFF (Moscow). The author narrates the following rare and interesting case from Professor N. V. Sklifosovsky's clinic, referring to a well-made and nourished peasant, æt. 28 years. About 11 months previously the patient's one-barrelled gun had burst in his hands, causing a wound of the forehead with hæmorrhage, total right-sided blindness, vertigo, splitting headache, and repeated vomiting of 24

hours' duration. In a day or two the frontal and orbital regions became intensely swollen, while later on there appeared incessant blood-stained purulent discharge from the wound and an occasional flow of pus from the right nostril. About the end of the third month, the frontal wound contracted down to the size of a straw, though still continuing to discharge some turbid serum. For the next four months the man felt practically well, regularly attending to his hard field-work. Subsequently, however, the wound became enlarged and the discharge began to increase. About a month before admission the patient extracted from the fistula a piece of blackened wood, $1\frac{1}{2}$ cm. long. On examination by the author, the right orbital region was found strikingly prominent and displaced downward and outward, the superior inner angle of the right orbit standing 2 cms. below the level of that of the left. The right eyeball was bulging out and deviated downward and outward about 2 cms. Slightly to the right from the median line, above the glabella there was seen a depression 2 cms. long and $1\frac{1}{2}$ broad, from the bottom of which a black, hard, sharp-edged foreign body, measuring $1\frac{1}{4} \times \frac{3}{4}$ cm., was protruding. A probe introduced under the inferior surface of the body could penetrate 3 cms. deep, striking some hard obstacle. There was present abundant purulent discharge. The right cornea proved to be partially infiltrated, choroid membrane and central retinal artery ruptured, retina detached, vitreous body opaque, optic disc atrophied. Smelling was very defective, the patient complained of occasional right-sided frontal and parietal headache, but otherwise felt fairly well. The wound was enlarged and the foreign body extracted (with considerable difficulty). It was found to be a gun's chamber weighing 60 grammes and measuring $3\frac{1}{2}$ cms. in length and $1\frac{3}{4}$ in diameter. In the posterior wall of the right frontal sinus a hole (of the size of a cherry stone) was detected, through which the dura mater could be seen. A forefinger introduced into the sinus easily penetrated into the right orbit. The wound was washed out with boracic acid, and the sinus plugged with iodoform gauze. Recovery went fairly smoothly. On examination, 20 days later, exophthalmus proved to have markedly decreased, the orbital regions being

almost symmetrical.—*Letopis Khirurgitcheskaho Obshtchestva v' Moskve*, No. 3, 1890, p. 158.

VALERIUS IDELSON (Berne.)

II. The Treatment of Stenoses of the Œsophagus. By DR. GRASER (Erlangen.) The treatment of stenoses of the œsophagus, especially those caused by caustics, is very difficult. The reason of this is, first, the pain caused by the bougie treatment, and secondly, the absence in the early stages of symptoms which in the patient's mind necessitate treatment. It is only when death through starvation threatens the patients that they will submit to treatment. At this late stage the stenoses have become very narrow and are low down; possibly a few centimetres above the cardiac orifice; there may be a second stenosis at the level of the cricoid cartilage and a third at the level of the bifurcation. If such stenoses are to be treated with bougies this must be done daily and for a period of at least a year, sometimes more, until the largest sizes can easily be passed. If the stenosis is very narrow it is not always possible to reach the stomach with the sound; this is due partly to the curve at the mouth. Even should a sound be passed in these cases, a cure is not necessarily promised. The most various forms of instruments have been recommended in these extreme cases and the author advises therefore a preliminary œsophagotomy as an aid to treatment. Such a course is pursued in the Erlangen Clinic by Prof. Heineke. The bougies can be passed quite easily even in very narrow stenoses through an opening in the neck; there is no curve to contend with. The great advantage, however, lies in the fact that the sound can be allowed to remain in situ a long while and thus a rapid dilatation may be secured. At the end of a week the narrowest stenoses will allow the passage of a very large sized sound and food can be administered through a hollow bougie. The opening in the neck is allowed to close if the bougies of large size can be easily passed through the mouth. The procedure is without any special danger and was formerly employed only in desperate cases. Carcinomatous strictures may be treated equally well with this method.—*Beilage zum Centblt. f. Chirg.*, No. 25, 1890

III. Final Results after Arterial Ligation in Struma. By PROF. RYDYGIER (Krakau). After citing the eleven cases of ligation of Porta, Wölfler, Obalinski, Billroth and Matlakophi, the author described his own 21 cases of ligation of the thyroidal arteries which had been operated upon some time past at an interval which allowed some deduction as to the value of this operation. In ligating the superior thyroid the method of Droback was used in 14 cases. The artery with this method is easily found even in the largest goitres. The author has concluded that the unilateral ligation of the vessels is unsatisfactory in spite of the good results of Porta and Wölfler. Less satisfactory is the ligation of either both superior or both inferior thyroids; Kocher's method of ligation is also not productive of permanent results. Collateral circulation is soon and satisfactorily established and the result is nil. Cachexia as far as statistics show is not to be feared after the above. Even theoretically this would not be so inasmuch as the goitre does not disappear entirely though all the arteries be ligated. In struma fibrosa the ligation of all four arteries is of no value. In cystic goitre the results have not been good; in none of Rydygier's cases did the cysts become smaller after operation. These cases had to be treated subsequently with enucleation of the cysts. In gelatinous struma cysts appeared after ligation which did not exist previous to this operation. In gelatinous struma ligation in large struma relieved the dyspnœa and reduced the size of the goitre somewhat.

The results, however, were so unsatisfactory that in one case a first resection was subsequently (one year later) resorted to. The best results were attained in small recent parenchymatous strumas, in which the strumas become smaller, even normal, in size. In the discussion which followed Eiselberg (Vienna) stated that Billroth had ligated in 7 cases of very vascular parenchymatous strumas. Four were cured. The remaining 3 were subsequently extirpated.—*Beilage zum Centblt. f. Chir.*, No. 25, 1890.

HENRY KOPLIK (New York.)

IV. Report of 31 Cases of Intubation of the Larynx in Diphtheria. By DR. URBAN (Leipzig). The above paper is

founded upon a series of cases operated upon in the service of Prof. Thiersch of Leipzig. The operation of intubation was performed in this clinic from December 15, 1887, to March 25, 1888, and the above is the result of operations performed in this period. The author gives a very concise description of instruments and operative procedure; the well-known difficulties and accidents attending the operation are also treated of. The difficulties of feeding these cases seems to have been great in the Leipzig clinic at a time when this obstacle was treated by the mechanical attachment of Waxham to the tube of O'Dwyer but the reviewer fails to find any mention of the simple device of position which O'Dwyer now tells us is quite satisfactory in overcoming difficulties in this direction. Of the 32 cases of intubation 18 had to be tracheotomized subsequently. The causes alleged are difficult nutrition (3), insufficient respiratory space (8), sudden obstruction by membrane (4), œdema glottidis (1), insufficiency in nutrition and respiration (2). All the cases thus tracheotomized died. Of the remaining intubated cases (14) only 3 recovered and these were cases of slight severity. The ages of the children ranged from 1 to 8 years. The causes of death in the intubated cases were bronchitis, diphtheria with sepsis, acute nephritis, gangrene of the lung. Among the advantages cited for intubation are; *a*, in this operation the air passes through the natural passages thus obviating the necessity of warming or medicating the air of the sick room; *b*, intubation is certainly a bloodless operation and eliminates to a great extent any sepsis though the pressure caused by the tube in intubation may lead to sepsis; *c*, the granuloma of the tracheal opening in tracheotomy is avoided, though pressure effect of the O'Dwyer tube even at its lower extremity cannot be eliminated: pneumonias (schluck pneumonia) and pulmonary gangrene are certainly rarer than commonly supposed and are not caused by the tube or the operation but rather occur in patients whose vitality is very low. Both operations may be regarded as of equal difficulty in performance. Intubation has the advantage of needing less preparation and to the practicing physician it is important to be always in a position to perform an immediate step for the relief of his patient. The immediate effect of intubation is striking and not to be

misinterpreted while on the other hand the difficulties in swallowing are always present to a greater or less degree, whereas, in tracheotomy this is not the case. In 18 of the above cases subsequent tracheotomy was necessary to relieve the symptoms which author thinks speaks in favor of tracheotomy (though none of these secondary tracheotomies recovered. Reviewer). Author thinks that the milder cases of diphtheria of the larynx are only fitted for intubation and that the severe cases of diphtheria of the larynx are fitted for tracheotomy only. He thinks that tracheotomy is the far reaching and more satisfactory operation. The advantages brought by intubation cannot compensate the danger of the same. Intubation has been abandoned since 1888 in Leipzig. (It might not be out of place to say here that the above conclusions as regards intubation are of interest in view of the fact that O'Dwyer has always insisted that his operation was performed by himself when he was certain that the patient would die if not relieved. We believe we are right when we say that O'Dwyer has from the first fought against hap hazard intubation. He has insisted that he has only intubated in the severest cases, "the forlorn hope" cases, and in these cases one of his statistics shows a recovery of 24%. We can only explain the conclusions of the German author on the ground that he has expected too much from the reading of cases of intubation by American operators recorded as successful which perhaps O'Dwyer himself would never have intubated. Reviewer).—*Deutsche Zeitsch. f. Chir.*, bd. 31, heft 1 and 2.

HENRY KOPLIK (New York).

V. Thyreotomy for Multiple Papilloma of the Larynx.
By VAN ANROOY (Holland). In October, 1887, a girl, æt. 17 years, came under the author's treatment for chronic hoarseness which had lasted for 5 years. The cause of the affection was found to be a chronic laryngeal catarrh and papillomata at the free edge of the true vocal cords. Otherwise the patient was healthy. The neoplasms were removed, galvano-cautery applied and the vocal cords were brushed over with a solution of nitrate of silver. Phonation did not improve and soon new papillomata developed which were again re-

moved. This operation had to be repeated several times. In September, 1889, the tumors also attacked the false vocal cords and finally caused such dyspnœa, that tracheotomy became a necessity. A fortnight later, when thyreotomy was to be performed for the removal of the papillomata, the canula was seen to be occluded by soft granulations in the trachea; these were removed and a large sized English catheter inserted. After eight days the patient could breathe without difficulty through a silver canula. Thyreotomy was now performed. A tampon canula could not be used on account of the narrow calibre of the trachea. Artificial respiration had to be resorted to twice at the beginning of the chloroform anæsthesia. This anæsthetic was, therefore, discontinued and 1 gramme of a 5% solution of cocaine was injected along the larynx. The larynx was divided as far as the thyroid cartilage and ligamentum conicum; the tumors were removed and the places of their origin cauterized; some more cocaine being instilled while this was done. The hæmorrhage was not severe, and violent attacks of cough expelled the blood which ran down the trachea, thus rendering tamponade dispensible. The incision in the thyroid cartilage was closed by three catgut sutures. The operation was perfectly painless for the patient. Five days after the operation the wound had closed by first intention; the canula was removed. Entire healing of the wound resulted a few days later. The sound of the voice was very much improved.—*Weekbl. van het Nederl. Tijdschr. voor Geneesk.*, 1890, i, No. 8.

VI. Foreign Body in the Right Bronchus. By DR. J. BONDESEN (Copenhagen). The following case was presented to the Copenhagen Medical Society: A boy, æt. 3 years, was brought to the "Kommune-Hospital;" the child while sitting and playing with some kernels from a piece of St. John's bread, was suddenly seized with difficulty in breathing, which however soon passed away and when the speaker saw the patient the breathing was natural; physical examination of the larynx and chest revealed nothing abnormal. In the course of the night following there was some dyspnœa, which increased

towards morning and for which toward noon of the next day deep tracheotomy was performed. No foreign body could, however, be found and it was supposed to have sunken into a bronchus. The respiration after the operation and introduction of the canula became freer. The general condition during the course of the day was quite good, but toward evening the dyspnœa increased more and more, and when the speaker saw the patient a few hours after there was extreme œdema with pronounced cyanosis and collapse. Physical examination of the chest revealed the entire right lung to be completely out of function, and the foreign body in the right bronchus and completely occluding it. The canula was then removed and after considerable force a pair of pharyngeal forceps were inserted deeply down into the right bronchus, the foreign body grasped and extracted; it proved to be a kernel of St. John's bread, swollen up to 3 or 4 times its ordinary size. Recovery took place and the child was perfectly well in fourteen days.

The speaker regards such cases as quite rare, for in looking over the various large statistical tables on foreign bodies in the air passages, (Kühn Gross, Sander and others) he has only found one such case, (Guersant's) where by a fortunate tracheotomy a bean was removed from one bronchus. On the contrary there are several cases of fortunate extraction of irregular and non-occluding foreign bodies from a bronchus, scattered through the literature. In the discussion which followed Dr. E. Schmiegelow communicated the case of a man, æt. 50 years, in whom a rhinolith with a small seed-like kernel as a nucleus, was found. The patient, when about 4 years old, had played with some small seeds, when suddenly he began to cough, had bronchitis, pneumonia and empyema, and later suffered continually from cough with purulent expectoration and dullness here and there on percussion. Schmiegelow assumed that one of the seeds had gotten into the bronchus, caused there the local trouble and at one or an other time had been coughed up and lodged in the posterior nares whence it was removed, after which all the symptoms disappeared.—*Hospitals Tidende*, March 26, 1890.

A. PICK (Boston.)

CHEST AND ABDOMEN.

I. Extensive Resection of the Thorax Wall With Permanent Exposure of the Pleura in Cases of Severe Tuberculosis of the Left Thorax Wall, the Left Pleura and Lung. By Dr. H. TILMANS (Germany). The patient in whom the above operation was performed was *æt.* 28 years, and was a sufferer for $2\frac{1}{2}$ years with tubercular empyema. The left lung was crippled, tubercle bacilli were found in the sputum, and there were many fistulæ in the thorax wall. The right lung was as yet healthy. An extensive resection of ribs in front and behind was of little avail, the lung did not expand, and the cavity of the pleura continued suppurating. Tilmans then resected the left anterior thorax wall in toto, from the 2d to the 6th rib, and to the breadth of 5 to 12 cm. The left pleura was extensively diseased and tubercular, the gap made by the resection was covered by a thin flap of skin, the cavity of the pleura and the surface of the contracted lung curetted and tamponed with iodoform gauze. The tuberculosis of the left lung has healed spontaneously, perhaps with aid of the iodoform; it does not expand. The heart is permanently dislocated to the right; the right lung acts well. A cure has resulted, and the operation is recommended for similar cases; also where tumors exist in the pleural cavity.—*Beilage z. Centr. f. Chir.*, No. 25, 1890.

II. Electropuncture in Aortic Aneurism. By Dr. H. TILMANS (Germany). The author performed electropuncture in one case of aneurism of the arch of the aorta, the patient being *æt.* 54 years, and presenting at the right second intercostal space. The tumor was soft, pulsating, and covered by very thin layer of skin. The patient suffered from vertigo, palpitation and sleeplessness, also a feeling of pain in the right arm and region of the right chest, accompanied by a steady loss of power in the right arm. In the space of about seven weeks the tumor was punctured with the electropuncture needle 13 times. The anode was attached to the needle, the kathode placed upon the skin in the vicinity of the tumor. The sittings lasted 5 to 10 minutes. The current was 30 milliamperes in strength. A flint rheo-

stat was used to regulate the current. The result of the electropuncture was striking; the tumor became smaller and harder, and only deep pulsation could be felt, and the subjective symptoms disappeared. The good result has persisted for a year and 9 months without any accident. In a second case of an enormous aneurism of the aorta ascendens, which projected into the right axillary region, electropuncture was performed 6 times, but the patient died of rupture of the tumor. The electropuncture did not cause the rupture. On autopsy it was seen that at the place of puncture the wall of the aneurism had thickened and clots had formed. The literature teaches us that in most cases the electropuncture method is only palliative, and in some cases valueless. Tilmans had not observed any bleeding or necrosis at the point of puncture, or the rapid formation of clots leading to the liberation of emboli.—*Beilage z. Centr. f. Chir.*, No. 25, 1890.

HENRY KOPLIK (New York).

III. Epithelioma of the Œsophagus. Ulceration of the Aorta. Death from Hæmatemesis. By M. VIMONT (Paris). Jean-Louis S., æt. 68 years, a cooper, entered the hospital St. Antoine, April 29, 1890, coming under the care of M. Landreieux. This man had complained for two months of girdle pains and difficulty in swallowing his food. His appetite was good. For two months deglutition become more painful, he fell away in flesh and decided to enter the hospital; up to then he never had suffered from vomiting or hæmatemesis.

At his entrance into the hospital the patient was emaciated, complained of violent pain in the region of the stomach, of inability to eat solid foods and lives upon bouillon, milk and broths. Catheterization of the œsophagus revealed a stenosis situated 12 inches from the jaw. His age and cachectic appearance made epithelioma seem probable but as there was at the same time an aneurysmatic dilatation of the arteries of the arm an aneurysm of the aorta comprising the œsophagus appeared plausible.

May 11 the patient was taken with hæmatemesis and indeed so gravely that death followed quickly.

The necropsy revealed an ulceration of the œsophagus 4 to 5 cms. in length, the base covered with a bloody detritus mixed with clots of blood. The margins of this ulceration were hard and callous. At the base of the ulcer there was a small opening communicating with the aorta. Microscopically the growth was found to be an ulcerated epithelioma. The stomach was found filled with clots, 500-600 g. in weight. The other organs were negative.—*Bulletins de la Societe Anatomique de Paris*, May, 1890.

IV. A Case of Pulmonary Abscess; Gangrene; Pneumotomy, Followed by Recovery. By v. OPENCHOWSKI. The patient concerned in this case was a man, æt. 30 years, in whom an abscess of the lung had developed after pneumonia; which finally terminated in gangrene of the lung. Pneumotomy was performed. After resection of a piece of rib, 10 cms. long, it was found that the layers of the pleura were adherent. The thermo-cautery had to be inserted 2 to 3 cms. deep into the lung tissue, and thus the cavity was opened. A large amount of pus evacuated itself on opening. The cavity was irrigated with a lukewarm solution of permanganate of potash. The further course of the case was a favorable one and the patient recovered.—*Zeitsch. f. klin. Med.*, bd. xvi, heft 3 and 4.

V. A Case of Pyothorax Subphrenicus. By DR. J. W. RUNNEBERG (Finland). The patient, a man, æt. 47 years. He was first taken ill with a chill, about 4 months ago, and had to remain in bed for a long time. He was lately troubled with cough but no expectoration, palpitation and asthma. When he entered the hospital remittent fever was present. The left lung was normal but the right, on physical examination, gave a resonant sound, absence of respiratory sounds and pectoral fremitus.

Exploratory puncture yielded thick, not putrid, but somewhat disagreeably smelling pus. The other organs were healthy; no tubercle bacilli could be detected.

Empyema being diagnosed the right pleural cavity was opened by means of a resection of the 8th rib, but was found to be empty. An

exploratory puncture through the protruding diaphragm showed that the pus had collected beneath it. No further operation was, however, undertaken and the wound only tamponed. As a consequence of this pneumo-thorax of the right side appeared. Five days later 1,000 ccms. of pus were evacuated by incision of the diaphragm. About a month afterward empyema of the right pleura had to be treated by resection of the 8th rib. A fistula, resulting from the last operation, existed at the time of dismissal of the patient, about 4 months after his entrance into the hospital. The patient recovered slowly, later on.—*Finska La Karesellskapets Handlingar*, 1890.

VII. Cholelithotripsy for the Relief of Occlusion of the Ductus Choledochus with Complete Recovery. By DR. KOCHER (Berne). The case of the author, occlusion of the choledochus with a perfectly shrunken gall-bladder, did not, on account of the latter circumstance, permit of a cholecyst—enterostomy. Kocher exposed the ductus choledochus by means of a transverse abdominal section parallel to the edge of the thorax, also severing all adhesions of it with the omentum, small and large intestines. The duct could now be seen to be very much dilated in the depth of the abdominal cavity, having there a circumference of about 2 cms. At this place a stone could be detected which lodged very firmly in the duct. Kocher attempted to crush the stone between his fingers (taking it between his thumb and middle finger), in which he succeeded. A smaller calculus which was felt in the duct was also crushed successfully in the same manner. Relief and recovery were prompt and complete. The pieces of the crushed calculi were taken out from the fæces with which they were passed afterward. They presented, when dry, a volume of $2\frac{1}{2}$ ccms.—*Fortschritte der Med.*, No. 12, 1890.

ALBERT PICK (Boston).

VII. Two New Cases of Laparotomy for Gunshot Wound of the Abdomen. By Dr. DAVID BARROW (Lexington, Ky.). In the *Jour. of Am. Med. Ass'n* of June 15, 1889, the author reported four cases of gunshot wound of the abdomen treated by lapa-

rotomy, of whom three died and one recovered. He now reports in the same journal for August 9, 1890, two new cases, with one death and one recovery. The cases are as follows: A boy, *æt.* 15 years; wound one inch and a half to the left of and on a line with the umbilicus; missile, a 32 calibre ball, discharged at short range. Was seen by the surgeon three hours after the accident. He was then in bed, with the lower extremities flexed; vomiting was frequent, and he complained of great abdominal pain; the facial expression was anxious, and the abdomen was hard and retracted; pulse was over a hundred and rather weak; shock was evident but not extreme. The wound was not probed, but it was plain that the cavity had been entered, and all the symptoms pointed to visceral wounds. As soon as the necessary preparations could be made, taking about an hour, laparotomy was done under chloroform. Incision six inches long; six perforations found in the intestines, four in the small and two in the large bowel; silk suture; reinforcement of one of the suture lines of the large bowel with omentum with copious irrigation with boiled cistern water; glass drainage tube; duration of operation 1 hour and 15 minutes; severe shock at close of operation; reaction slow; morphia in small doses as required to relieve pain for 10 days. The drainage tube was emptied frequently and was removed on the sixth day. Convalescence was uneventful. The bowels were moved on the seventh day and stitches taken out on the eighth. There were several stitch abscesses and a small superficial part of the incision healed by granulation. Three weeks after the operation, on account of imprudence in diet, he had a severe attack of indigestion, with much vomiting, and was greatly exhausted. He is now perfectly well.

Second case. Boy, *æt.* 13 years, wounded by a 32 calibre ball; point of entrance two inches to the right, and one inch below the level of the umbilicus. Operation four hours later. At the time of operation there were no symptoms indicating serious injury: there had been no vomiting; the pulse was 80 and regular, and the boy was comparatively comfortable; chloroform; four inch vertical incision passing through the wound; the ball had passed downward and to the right. Tracing the intestines five perforations were found, two in the ileum

and three in the cæcum. These were sutured with fine silk by the Czerny-Lembert method; the cavity was irrigated with boiled distilled water; the abdomen was closed and antiseptic dressings applied. Duration of operation a half hour. There was no shock when put to bed, and he rallied promptly from the anæsthesia. For two days he did well, when the temperature went up to 101° and he began to vomit. The abdomen was reopened, and irrigated with boiled distilled water and a rubber drainage tube inserted. He died at the end of the third day of septic peritonitis. Post-mortem demonstrated all perforations securely closed; there was no leak when the gut was distended with water; some loops of the intestines were adherent, and there were several ounces of bloody fluid in the peritoneal cavity. The author believes that this boy would have recovered had he inserted a glass drainage tube at the time of the operation. The operation was done in a negro's cabin, and the hygienic surroundings were most unfavorable.

VIII. Causes of Error in the Diagnosis of Calculous Affections of the Liver. By Dr. Cyr (France). The author discusses the rare cases of gall-stone affections, which from their unusual course and complexity of symptoms may lead to errors in diagnosis. The following is a summary of the matter as presented: 1. A gall-stone may exist for a long time with acute disturbances, referable to the liver, arising. 2. During the attacks of biliary colic the pain is frequently referred to the epigastrium and the lumbar region, simulating renal colic; in rare cases, in the right breast and about the umbilicus. 3. The onset of the attack may be so sudden and violent as to suggest acute poisoning. Symptoms of eclampsia and hysteria likewise have been observed; indeed, the attacks may even simulate cholera.

The fact that the treatment of this class of cases is being relegated to the surgeon, renders the matter of greater importance to the latter than heretofore.—*Arch. Gener. de Med.*, February, 1890.

G. R. FOWLER (Brooklyn).

IX. Vermiform Appendix Peritonitis. By DR. GRASER, (Erlangen). The author has made his studies in the clinic of Prof. Heineke, of Erlangen. He points out the fact that most of the processes described formerly under the titles of typhlitis, peri-typhlitis and para-typhlitis take their origin from the vermiform appendix. The process begins by ulceration of fæcal calculi and results in the formation of pus with perforation. The whole process is intra-peritoneal since the vermiform appendix is entire surrounded with peritoneum. The dangers of this disease are mostly directed toward the young. Matterstock makes the mortality 30% in the adult and 70% in children up to the 15th year. Formerly perforation into the peritoneal cavity was always fatal. The studies of Mikulicz and Krönlín have made it possible to treat these cases successfully by laparotomy. During the past year 3 children were saved in the Erlangen Clinic by the removal of the vermiform process. In one child there was diffuse septic peritonitis, in the two others the process was circumscribed. In those cases where adhesions prevent the spread of peritonitis and circumscribed abscesses are formed in the meshes of intestines, the disease is not so dangerous as it is prolonged, the mortality according to Fitz being 11%.

The treatment of rest, opium and ice had hitherto only been conducive to the formation of adhesions and limitation of the abscess. Operation here is indicated when an abscess has formed and threatening symptoms (collapse, threatened perforation, intestinal obstruction) appear. The author thinks that in most cases the operation is performed too late or the patient is unnecessarily exposed to a long and exhausting illness. Operation should be performed as soon as the diagnosis of perityphlitis is established. Sudden illness, with high fever and radiating pains and increased resistance are the reliable symptoms of diagnosis. Even in cases where operations have been delayed an exploratory incision is allowable in those cases where even after subsidence of first symptoms, a continuance of pain and resistance and pain on pressure is manifested with evening rises of temperature. In most cases the incision will expose a focus of suppuration. If the vermiform appendix be found it should be removed. No harm is done

if the incision should give negative result. The author thinks the surgeon should have early access to these cases.—*Beilage z. Centblt. f. Chir.*, No. 25, 1890.

X. The Pathology and Therapy of Perityphlitis. By DR. SCHUCHARD (Stettin). The author has treated 9 cases of perityphlitis during the past year. Of these cases one, a man, æt. 20 years, died on the 8th day, having refused operation. Four cases of mild variety (ages, 8, 22, 19, males) resolved under medicinal treatment. Three cases were operated upon, the first, a male, æt. 32 years, farmer, operated upon in the third week, a large foul abscess in the iliac region opened and drained. The second case, male, æt. 22 years, abscess opened on the fifth day; recovery. The fourth case, female, æt. 21 years, also operated upon on the fifth day; in both the latter cases the author thinks the abscesses were extra-peritoneal. In both these cases the temperature did not go beyond 38.4° and they were plegmons of the retrocæcal tissue—neither fæcal calculi nor the vermiform appendix were found in the abscess cavity. These cases do not bear out the old theory of the causation of these processes by the perforation of the vermiform appendix by fæcal calculi but the above cases should be rather considered paratyphlitis phlegmonosa just as we have in similar cases a paraproctitis. In both diseases the pus of the abscesses is bad smelling and fæcal. The author advocates early surgical interference by an incision similar to that for the ligation of the iliac. In old cases incision is made into the most prominent and fluctuating point of the tumor.—*Beilage z. Centblt. f. Chir.*, No. 25, 1890.

XI. The Radical Treatment of Perityphlitis by the Early Resection of the Vermiform Appendix. By DR. H. KUMMEL (Hamburg). The numerous observations and autopsies which have been made during the past few years leave no doubt but that the disease perityphlitis is caused by an affection of the vermiform process, whether through ulceration, calculi, gangrene or any similar factor leading to final perforation of this process. In the author's classification the first and rare form of trouble is sudden perforation of the appendix

with rapid peritonitis. Operation has given little encouragement in these cases. The author has operated in one case within six hours after perforation and in the peritoneal cavity he found a cherry pit and the perforated vermiform appendix, but in spite of operation the patient died in collapse. In these cases we should remove the vermiform appendix when the strength of patient allows it. The second group of cases are those in which inflammation of the appendix leads to the formation of the well-known perityphlitic abscess. In these cases also the early operative incisions should be made as soon as the diagnosis is established; we should not wait until a distinct abscess is formed and pointing. When the abscess is opened calculi and the gangrenous or necrotic appendix removed and drainage established, if the vermiform process be not found it should not be sought for too much through the loosening of adhesions or by compromising in any way the solidity of the abscess wall; subsequent formation of cicatricial tissue will perhaps obliterate the process and prevent return of trouble. The author has had a return of disease twice in the same patient. The author thinks that the primary ligature and removal of the appendix prevents formation of fistula, etc., also return of trouble. Perityphlitis must always be regarded as a serious disease, not only on account of the acute peritonitis, or perforation or general perforative peritonitis, but on account of the return of trouble which always threatens the patient. The patient who has once passed through a perityphlitis is always in danger. The least error of diet or trauma is likely to cause new trouble. Those which are most susceptible to relapses are the cases which do not result in the formation of abscess but in exudate around the appendix. In this third group, the chronic relapsing form, the exudate, under the influence of ice, opiates, etc., resolves only to return on the least provocation. In these cases the resection of the process is specially indicated and lasting cure results. The operation is performed after acute symptoms have subsided and the exudate has disappeared. The incision is made along Poupart's ligature or in the median line, the process ligated close to the cœcum and the stump closed with peritoneal suture. It is not a difficult operation. The author has operated on two such cases, mak-

ing the total published number of cases in the literature five, one by Treves and two by Senn. The first case was that of a man, æt. 42 years, who had suffered for four years in the above manner. The second was that of a woman, æt. 40 years, who for 15 years had been subject to a list of troubles belonging to the history of this third group. The author after relating at length his two cases advocates the resection of the processus vermiformis in this chronic relapsing form of perityphlitis.—*Beilage z. Centblt. f. Chir.*, No. 5, 1890.

XII. The Extirpation of Carcinoma Situated High Up in the Rectum, in Two Sitzings. By DR. L. REHN (Frankfurt, A.M.) The sacral method of Kraske enables us to remove by means of an excellent operating field, carcinoma of the rectum situated high up. Hæmorrhage can be easily controlled and a normal sphincter can be retained. The advantages of the operation are well known but the mortality is great, much more than the 20% now published would lead us to believe. The author lost three of his first five patients. In two cases the circular suture was complicated by the formation of a fæcal phlegmon. A third patient died in collapse twelve hours after operation. The first two cases were operated upon strictly after Kraske's method. Then the author in four cases made use of the osteoplastic resection by a preliminary operative procedure. Incision on the left side of the sacrum and ilium, transverse division of the sacrum between third and fourth sacral openings. Opening of the flap of the bone and soft parts to the right. His two last cases were operated in two sittings and had a more favorable course. In his sixth case the patient contracted an empyema following an attack of influenza at a time when the artificial anus should have closed.

The dangers of the operation are collapse and infection. The preliminary operation as soon as we decide to transversely divide the sacrum is of great moment for the patient. If the para-sacral incision is sufficient we should choose this as the most saving for the patient. It seems that some have overlooked the fact that Kraske, in his preliminary studies, established to his satisfaction that the parasacral incision gives in a remarkable manner room for operating. It remains

Kraske's operation whether we operate simply by incision of soft parts or the resection of bone, partial or complete. The manner of operating is that the growth should be removed, not from below, but from behind and above. The chief danger is infection from fæces, the circular suture holds in the rarest cases only, the rectum bursts generally behind. As precautions against secondary infection we use, 1, iodoform gauze tampon, (not always sufficient); 2, avoidance of the circular suture, the rectum is allowed to remain open in its posterior periphery and the rectum is split toward the anus; 3, colotomy after Schede; 4, Heinecke's measure. The author thinks that the above dangers may be avoided by two operations, 1st, preliminary operation, exposure of and loosening of the new growth, thereby avoiding any wound of the gut. The central portion of the gut is made movable preliminary to subsequent suture; careful arrest of hæmorrhage. The wound cavity is loosely tamponaded. The loosened gut is brought to the level of the external skin by passing strips of iodoform gauze underneath it. The patient receives opium for four days, then laxatives and injections are used. If it should now be shown that sufficient evacuation of fæces is caused by stricture, the intestine may now be incised without danger above the stricture. About ten days after the first operation the gut is circularly closed and after drains are put in, the wound is closed. By this time the wound has become considerably smaller. A failure of the intestinal suture at this time will not be of any danger to the patient. In case the gut should tear while loosening the growth in the first step then it is advisable to remove the growth at once the central piece of gut is attached to the skin at the lower angle of the wound. The circular suture of the gut follows in a second operation. —*Beilage z. Centblt.f. Chir.*, No. 25, 1890.

HENRY KOPLIK (New York).

EXTREMITIES.

I. The Curability of Malignant Growths of the Thigh-Bone by Exarticulation at the Hip-Joint. By DR. BORK (Rostock). The author has collected in addition to 9 cases operated upon in the Rostock Clinic, 109 cases of exarticulation of the thigh-

bone at the hip for malignant growth of the thigh-bone, occurring in the literature. All the above cases were observed for a number of years. In some cases the fate of the patients after operation is omitted and the pathological nature of the growths is obscured through insufficient data. Of the 118 cases 24 died as a direct result of operation from shock, carbolic acid poisoning, hæmorrhage, sepsis. In four cases the cause of death is not given; they died soon after operation probably as a result of the same. Of the remaining 86 cases, 50 must be rejected as being useless for statistics, nothing being noted of their course after operation and only 10 months have elapsed before publication. Of the remaining 36 cases, 26 died with metastases in other organs after periods varying from 4 weeks to 4½ years. One patient died with a regional return. Five cases died of intercurrent diseases. There remains four cases which were observed for a longer period than ten months. One of these cases which was operated upon 26 months ago was that of a female, æt. 26 years, with a spindle-celled sarcoma. The patient at present presents no symptoms of return. The second case recorded by Küster has remained free from symptoms for three years. The third case (Czerny) a periosteal fibro-sarcoma observed for 3 years, had two nodules on arm and back at time of publication though no internal metastases. MacGraw records the fourth case, observed 12 years, no metastases, though a suspicious nodule is present on the arm. These cases (4) cannot be looked upon as permanently cured. The above tends to throw doubt upon the operation as a curative indication.—*Beilage z. Centblt. f. Chir.*, No. 25, 1890.

HENRY KOPLIK (New York).

GENITO-URINARY ORGANS.

I. The Operative Treatment of Tuberculosis of the Kidney. By DR. MADELUNG (Rostock). Operative treatment in these cases was held to be hitherto out of the question but if it is applicable in certain cases as supposed it is absolutely necessary that such a conclusion should be reached from the consideration of statistics, which at present is not the case. The difficulties of treatment

from a surgical point of view lies mostly in the difficulty of making a diagnosis. We are justified in diagnosing tuberculosis of the kidney when the urine contains tubercular matter and the bladder is free from ulcerations of the mucous membrane. The demonstration of tubercle bacilli may be easy, difficult, at times impossible. Iohné's method of demonstrating bacilli is not always successful. Inoculation of animals is too tedious and the absence of bacilli is but negative proof. The inspection of the mucous membrane with Nitze's endoscope is also unsatisfactory. Tuberculosis once established it is necessary to find out which kidney is affected or whether both are diseased or whether the patient has two kidneys. If a tumor can be felt this combined with history of pain is satisfactory, if combined with other urinary symptoms (pus). But even all these symptoms combined or singly can mislead. Exposure of the kidney by the lumbar incision can be of use. Catheterization of the ureters after dilatation of the urethra is to be recommended in certain cases of disease in women. Such cases should be selected for operation in which spontaneous cure is out of the question, in which through long observation the unilateral disease has been made out, and in which the symptoms compel operative interference. Nephrectomy is an easy operation, and in persons much reduced by disease admissible. Tuberculosis of the bladder is the contraindication, but slightly advanced tuberculosis of other organs ought not to prevent operation. The nephrectomy can be palliative in rare cases. Lawson Tait and Küster have had such cases, and author saw one of his own cases uninfluenced by operation. The extra-peritoneal method is the best one to use, and thus the tubercular portion and the capsule (partly) can be extirpated, the ureter after suture is dropped into the wound. Iodoform gauze tampon and secondary suture. The urine, even in cured cases, may for some time after contain pus. A fistula which has remained for one year after operation may finally heal, and the continued use of creasote in the after-treatment seems to be beneficial. Author has collected sixty cases in the literature; Bardenheuer seems to have had the best results. Author has operated in 3 women for tuberculosis of the kidney, and in all has had good results, the patients increasing in weight after operation.

In one case there was affection of the apex. Author recommends nephrectomy in selected cases.—*Beilage zur Centr. f. Chir.*, No. 25, 1890.

HENRY KOPLIK (New York).

II. Renal Surgery. By Dr. EMIL SENGER (Crefeld). Since 1869, when, for the first time Simon extirpated the kidney, the surgery of this organ has made rapid progress, and at present we have aspiration, nephrorraphy, nephrotomy, nephrolithotomy and nephrectomy, and for this progress we are indebted to the progress made in methods of diagnosis. But, unfortunately, as yet this is far from perfect, and in many cases the weighty question of which kidney is affected, the right or the left, has to be decided by the subjective symptom of pain.

The importance of an exact diagnosis is specially important in extirpation of the kidney, for before the operation is undertaken, the surgeon must know if there are two kidneys present, as there may be a congenital absence of one kidney, or a functional atrophy, or a cake-like kidney with one or two ureters, or a horseshoe kidney. The second question which comes up is if the remaining organ is capable of performing its functions in such a manner as to keep the patient alive. Lastly, as Israel remarks, the condition of the heart plays an important part, a weak or fatty heart, or one with valvular insufficiency, tends to show that a compensatory function of the other kidney will be doubtful.

How are the first two questions to be decided? Percussion gives but little on the subject; more is obtained by palpation, and this latter is specially praised by Israel. The normal kidney is extremely difficult to palpate, and Thompson says it is only possible to make out by palpation a much enlarged kidney. There yet remains the rectal palpation of Simon and the exploratory incision.

Even if two kidneys have been made out, nothing is known as to their condition. To find this out G. Simon dilates the urethra and catheterizes the ureters with the aid of the finger introduced in the bladder. Pawlick introduces the catheter without dilating the urethra.

Emmet divides the vesico-vaginal wall and then catheterizes, but all these methods can only be employed in women.

Opposed to catheterization is compression of the ureters. Sands compresses by means of the finger introduced in the rectum. Weir uses a rod, and compresses the tube against the pelvis, but these methods are crude and work in the dark. Hegar dissects the ureter through the vagina and ligates it. Sawyer simply ligates it *en masse*, but both these methods are also useless in the male. Gluck proposes to dissect out the ureter by a lumbar incision and compress it long enough to obtain sufficient urine from the other kidney. There are two objections to this method, first, the cutting, and second, that the other kidney is rarely so damaged that it does not secrete, and the quantity of urine thus obtained is small. Wolfier determines the quantity of urine for 24 hours; if it is less than half the normal quantity both kidneys are materially diseased; if it approaches half only one kidney is damaged, and the other has taken on no compensating action.

Up to the present time the safest method yet is the formation of a renal fistula (provided that there are sufficient grounds to indicate that the kidney is diseased enough to require extirpation), and to so fix the ureter that all the urine passes externally. The proof that this has happened is not always easy. Israel states that if after the formation of a fistula, the urine from the bladder becomes clear, or if a colored fluid injected through the wound does not pass in the bladder, then it is pretty certain that all the urine from that kidney escapes through the fistula, and then that from the bladder can be conveniently examined qualitatively and quantitatively, and the chances for a nephrectomy considered. According to Israel, the following diseases are suitable for nephrectomy, with previous formation of a fistula: floating kidney, fistula of kidney and pelvis of kidney, wounds of the kidney and ureter, pyonephrosis, hydronephrosis, echinococci, tuberculosis, renal calculi, and tumors, malignant and non-malignant. As regards the diagnosis of these cases, it is better to begin with the most common, viz., pyonephrosis. In simple cases the clinical history is as follows: The patient has been suffering for a longer or shorter time from rheu-

matism or an obscure abdominal affection, or gonorrhœa, or even from a carbuncle; he complains of pain in the region of the kidney, has fever and some swelling of the side, which gradually increases, and later on, gives distinct fluctuation, together with a tympanitic note. The urine may be either purulent or normal. The tumor extends downward from the free border of the ribs. The colon, if distended, lies either over it or to its inner side. The liver may sometimes be isolated from the swelling. Aspiration gives pus. These are the easy cases.

Israel says that pressure on the tumor often causes a little pus to escape in the bladder, and this is of great help in making the diagnosis. If the urine is previously purulent, he compares it before and after pressure. Another important point in diagnosis is that the urine is alternately clear and purulent, according to the increase or diminution in the size of the swelling. The treatment is nephrotomy, and this is generally an easy operation. The abscess cavity, when opened, is explored to find the cause of the suppuration, and if a stone is found its removal is attempted. Often no cause is found, then the best possible conditions for drainage are sought, and the septa in the pelvis of the kidney are completely broken down and the pelvis drained. If the renal fistula causes the patient any pain, or purulent retention takes place, nephrectomy has to be considered. If nephrectomy is decided on, Dr. Senger calls special attention to the danger of tamponing the wound with strong iodoform gauze; on account of the danger of poisoning he says that no stronger than 2% gauze should be used.

The differential diagnosis between hydronephrosis echinococci, tuberculosis and tumors is settled by aspiration.

Tuberculosis as a rule is always secondary to the same trouble in the bladder. Tubercle bacilli in the urine give no indication to the seat of the disease. Tuberculosis is easily mistaken for renal calculus, but in the latter there is frequent and profuse hæmorrhage, while in the former the intervals between each hæmorrhage are very long.

Renal tumors are extremely difficult to diagnose before they have attained a certain size. Hæmorrhage is absent till the growth begins to attack the pelvis. The hæmorrhage is similar to that of stone, but is not set up or influenced by bodily exercise. If the tumor has a sharp

border it is not renal; it may be hepatic or splenic. It is as yet impossible to determine if the tumor be malignant or non-malignant, but there is one good point—tumors of the kidneys are generally single and only break through the capsule very late.

In cases of large tumors in children the operative results are very bad; so far, no child has survived any length of time.

In tubercular kidney, nephrectomy is not curative, on account of the dissemination of the process, but it may be palliative.

In all cases it is safer to do a nephrotomy, and secondarily a nephrectomy, if necessary.

If a stone is thought to be present, the pelvis of the kidney may be exposed by an extra-peritoneal incision, and if it is not felt the kidney may be punctured in various directions by a fine needle, and if this yields no results the pelvis may be opened and each calyx explored separately by the finger, and if this is not successful, Thornton proposes a laparotomy and palpation of the kidney with the hand. As last resort, when the pains are unbearable, there always remains extirpation. Still, before resorting to this it is better to first drain the pelvis and wait, for often after this the pains disappear.

Sometimes the stone lies either in the beginning or in the end of the ureter, and in such cases a nephrectomy is useless, and the stone must be sought for by rectal palpation and if found it is to be removed by dissecting out the ureter and opening it.

Floating kidney may exist without causing any pain, or it may sometimes be kept in place by a truss; if this does not answer nephrorraphy may be attempted, and Hahn's method is the best. In some cases this is not successful and the symptoms recur. For such cases nearly all surgeons advise nephrectomy.

Ureteral fistulæ following labor may usually be cured by some plastic operation, while those resulting from operation are not so; in such cases Simon and Bardenheuer advise nephrectomy. If this is not possible there only remains a transplantation of the ureter so as to have it open either on the abdomen, or in the vagina or in the rectum.—*Deutsche Med. Woch.*, No. 11, 1890.

F. C. HUSSON.

III. Partial Extirpation of the Kidney. By DR KUMMELL (Hamburg). With the constant progress of conservative surgery the question comes up of removing the diseased portion of the kidney instead of the whole of the organ in certain forms of disease.

It is important to determine if a wound of a larger or smaller portion of that organ would heal thoroughly or if a urinary fistula would result which would ultimately require a nephrectomy.

The experiments of Tuffier of Paris are interesting. They show that it is possible to successively remove a large part of the normal renal tissue, and that after a certain number of days, the sooner the less renal parenchyma removed, the specific gravity of the urine and the excretion of urea are perfectly re-established, and that compensation was due partially to hypertrophy of the remaining parenchyma and partly to the new formation of glomeruli, and this happened even in cases of animals in which one kidney had already been extirpated and was followed by a partial removal of the kidney on the other side. Tuffier as a result of his experiments states that in animals from 15 to 23 grains of renal parenchyma is sufficient for 2 pounds of weight. Reckoning the adult human weight at 140 lbs., from 1200 to 1500 grains of renal substance, apart from the capsule, which is not counted, is sufficient to maintain life, or about $\frac{1}{3}$ or $\frac{1}{4}$ of the normal organ.

Surgically, therefore, it is possible to remove a large part of the kidney, the remaining portion still retaining its function, and in partial destruction of the renal tissue it is not necessary to remove the whole organ, and we can be satisfied with a partial excision specially, if the condition of the other kidney is not known. Partial excision is in order in cases of not very large abscesses, in certain injuries, in circumscribed tumors, and even for exploratory purposes.

The only case of partial nephrectomy found in literature was reported by Herczel as occurring in Czerny's clinic in Heidelberg, when a gardener æt. 30 years was operated on account of hæmaturia and enlargement of the right kidney following a blow. On the convexity of the organ at the junction of the middle and lower third a fluctuating spot was incised, the cavity filled with detritus was scraped with a sharp spoon, and an elliptical resection of the renal tissue followed by

partial suture and tamponade was done. The case healed rapidly. In September, 1889, Dr. Kummell operated on a woman for an abscess of the kidney which was situated in the upper third of the organ, and due to a calculus which was removed at the same time. Smaller abscesses were found leading into the main cavity. These were all scraped with a sharp spoon, and the walls formed by renal parenchyma were excised and partially brought together by sutures and fixed in the external wound, about $\frac{1}{3}$ of the organ was thus destroyed or removed. The wound was packed with iodoform gauze and allowed to heal by granulation. The subsequent progress of the case was all that could be desired.

The urine flowed through the ureter and on the day after the operation contained some pus, which rapidly disappeared, and the secretion soon became normal. The patient was discharged in October with a granulating wound and since then she has gained 20 pounds.

In another case, a man æt. 55 years, Dr. Kummell excised the upper convex portion of the right kidney but the tissues were so scant that sutures would not hold and tamponade had to be resorted to. For the first few days after the operation the urine contained blood but this soon disappeared. No urine, escaped through the external wound. From the above related cases it is seen that the renal parenchyma seems to lend itself to operative interference. Hæmorrhage is easily checked by tamponing, and the secreted urine escapes by the normal passages without going through the wound and without there being any tendency to the formation of a fistula.

These circumstances are very favorable to exploring the pelvis of the kidney as has been already suggested by Israel.—*Centblatt f. Chirurgie*, No. 18, 1890.

F. C. HUSSON (New York).

IV. Operations for Stone in the Bladder. By Sir HENRY THOMPSON (London). The author read before the Royal Medical and Chirurgical Society a paper presenting the results of 964 cases of operation for vesical calculus, 500 of which had been discussed by him 12 years previously. Of the whole number 101 were hospital cases and

863 private cases. There were 17 children and 14 women, leaving 933 operations upon the adult male. The history of his cases embodied a history of operations for stone from 1854 to the present time.

The introduction of Bigelow's method of employing a single sitting reduced the mortality in the writer's hands to nearly one half.

An analysis of his entire series shows that vesical calculus is not more common in children than in adults, as was formerly supposed—an impression due to observations in hospital practice. The ages of his male patients were as follows, the mean age being $62\frac{1}{2}$ years:

Below 16 years,	-	-	-	-	-	3.
16 to 24 years,	-	-	-	-	-	8.
25 to 50 years,	-	-	-	-	-	89.
51 to 70 years,	-	-	-	-	-	565.
Above 70 years,	-	-	-	-	-	184.

The oldest patient was 91 years old, and was subjected to lithotrity. The largest calculus weighed 14 ounces and was composed of uric acid.

The author insisted upon the desirability of removing the stone at the earliest possible moment in the elderly male adult, where it is frequently found, for two reasons. (1) The stone, when small, can be removed more readily, and with little risk. (2) At this stage of calculous disease the re-formation of an acid stone can almost invariably be prevented by strict dietetic precautions.

Of the author's adult male cases, 800 were by lithotrity, 115 by perineal lithotomy, and 18 by supra-pubic lithotomy. The author's predilection for the crushing operation is evident. In the adult crushing may be carried to stones of four ounces, provided a large evacuating tube can be passed. The adult male of 65 to 75 years possesses a very insensitive and capacious urethra, while he had found the most sensitive urethras in men of from 25 to 40, and any over-distention of these frequently gives trouble. If an evacuating tube as large as No. 18 can be passed, a three-ounce uric acid stone when crushed can be removed with the greatest facility. In case of an irritable urethra with a rigid prostrate, admitting only a No. 13 or 14, the supra-pubic operation is preferable for a small calculus.—*Lancet*, March 15, 1890.

JAMES E. PILCHER (U. S. Army).

V. The Symptoms and Conditions Which Justify Nephrolithotomy, the Chief Conditions Simulating Renal Calculus, and Some Practical Points in the Operation of Nephrolithotomy. By W. H. A. JACOBSON (London). In opening, the author draws attention to the more rapid advances made in operative technique than have been made in diagnosis, especially as regards renal calculus. He mentions five cases in which he operated and no stone was found. He then considers the symptoms and conditions which justify nephrolithotomy under the following heads:

1. Continued hæmaturia, or passage of blood and pus.—He considers this a very important symptom and describes it as a hæmaturia of long standing, often repeated, frequently increased by exercise, rarely profuse, and never producing anæmia, as in new growth of the kidney. The blood is always intimately mixed with the urine, while the tint varies from a bright or deep red to a smoky or porter like color. He also mentions the following fallacies: (*a*) It may be absent to the last. This, he thinks, may be due to a contraction of the muscles about the kidney, so that movement is restricted. (*b*) The hæmaturia may be only temporary; this occurs with small renal calculi and when encysted. (*c*) It may not appear until late in the case. (*d*) Hæmaturia also occurs with other conditions, as passage of uric acid crystals, tubercular kidney, granular kidney, growths, increased intrarenal pressure, etc.

2. Pain and tenderness, lumbar and elsewhere. Under this division J. calls attention to the fact that lumbar pain varies in its characters, and that while in some cases it is relieved by pressure, in others it is not. He also mentions the fact of radiating pains being present in other parts of the body, as testis, foot, calf, etc., and having no reference directly to the kidney. Another point is the frequency of nocturnal exacerbations of the pain. These are apt to be very severe. With regard to tenderness, he refers to Mr. Jordan Lloyd's paper, in which much stress is laid on percussion over the kidney, in the loin just below the last ribs, in a direction upward, forward, and slightly inward. This is best practiced with the patient standing upright. The blow should be sharp and decisive. This gives rise to a characteristic stabbing pain.

3. Points in the previous history. Long standing lithiasis and oxaluria is usually accompanied with changes in the minute anatomy of the kidney, and it is obvious that with this condition there is probably a bilateral stone. The passage of numerous small calculi does not point to the necessity of operation, while well marked renal symptoms without the passage of any calculi, point to the probability of a single small calculus. Renal colic may be caused by a stone distending the pelvis of the kidney and not passing into the ureter.

4. Frequency of micturition. The point raised in connection with this symptom is whether the presence of a renal calculus without bladder irritability does not point to the location of the stone in one of the calyces rather than in the pelvis of the kidney. Bladder irritability may also be an aid in making the differential diagnosis between calculous and tubercular kidney, as with the former condition the symptoms usually subside with rest in bed.

5. Absence of any condition in the rest of the genito-urinary tract which will explain the symptoms.

6. Failure of previous treatment to give relief.

The chief conditions simulating renal calculus are next considered.

1. Lithiasis can be easily distinguished by the results of treatment.

2. Tubercular kidney. The chief aids in diagnosis of this condition are given as:

(a) Pyuria usually presents early with albumen, and without much hæmaturia.

(b) Careful examination of urine shows caseous matter and debris of connective tissue and the bacillus tuberculosis.

(c) Pyrexia is present from the first.

(d) Early exploration of the kidney to clear up the case and to perform nephrectomy, if the kidney be found tubercular. J. calls attention to the fact that in the earlier stages usually only one kidney is involved.

3. Slight pyelitis, not tubercular; 4, Movable kidney; 5, Aching kidney, especially common in women; 6, Nephralgias due to disease in parts adjacent to the kidney, as duodenal ulcer, intestinal irritation, etc.; 7, Gall stones retained in the gall-bladder; 8, Spinal disease; 9,

Interstitial shrinking nephritis; 10, Growth of the kidney in its early stage, and 11, Malignant disease involving the last dorsal nerve, are given as other conditions often difficult to diagnose from renal calculus.

The following are given as the chief practical points in the performance of nephrolithotomy; 1. To count the ribs. 2. To make a sufficiently free incision. 3. To pack away the colon with sponges. 4. To draw the kidney up into or out of the wound if palpation and exploration have failed to find the stone. 5. In puncturing the kidney, to try, as far as possible, to open the calyces systematically. 6. If palpation and acupuncture fail to find the stone the kidney should be opened and sounded. For this Jacobson recommends the incision of Mr. Jordan Lloyd. 7. Hæmorrhage is certainly arrested by firm, careful plugging with gauze. 8. Sources of difficulty in removing the stone; a mobile kidney; a stone situated on the anterior surface and near the entrance of the vessels; a small stone in a sacculated kidney. 9. In case of multiple calculus in a suppurating damaged kidney, nephrectomy should not be done until after the kidney has been thoroughly drained. 10. If the kidney has been much disturbed it should be stitched *in situ*.—*Brit. Med. Jour.*, Jan. 18, 1890.

H. B. DELATOUR, (rooklyn.)

VI. A Case of Pyonephrosis; Nephrectomy; Cure. By DR. JANSEN (Norway). The patient, æt. 44 years, a woman and a morphine habitue. She has had a tumor for 13 years, but it has caused her pain only within the last two years. The pain, which was of a radiating character, extended over the whole abdomen and upward toward the shoulder, as well as down the thigh of the corresponding side. Lately the tumor has increased in size, this being accompanied by pressure in the region of the bladder and difficulty in urination. Blood was found in the urine at intervals. The solid tumor filled the entire left side, extended to the median line and somewhat below the umbilicus. It presented an uneven feel to the touch. A slight dislocation upward was possible, but caused pain. The left ureter could be felt to be of normal size from the region of the left sacro-iliac synchondrosis up to the pelvis of the kidney. The right kidney could

be distinctly palpated; it was smooth to the touch and not sensitive to pressure. The urine, on microscopic examination was found to contain albumen, hyaline and granular casts, pus corpuscles, pavement-epithelium and jagged cells. The quantity of urine oscillated between 500 and 1500 ccms. within 24 hours. Extirpation of the kidney was performed on March 16, 1889, an incision 15 cms. long and parallel to the curve of the ribs being made. In the removal, the tissue of the kidney was accidentally incised and 500 ccms. of thick pus evacuated. Two silk ligatures were applied to the pedicle, the ureter being ligated separately. The enucleation of the 22 cms. long sac was accomplished without hæmorrhage. The further course of the operation as well as of the recovery was uneventful. The urine, for a short time after the operation, contained traces of albumen. The careful pathologico-anatomical examination of the removed tissue led to the exclusion of tuberculosis. The patient was dismissed as cured on June 17, 1889. —*Norsk. Magaz. for Laegevidensk.*, 1890.

VII. Case of Renal Cancer; Removal by Nephrectomy.
By J. SVENSSON (Sweden). The patient, female, æt. 41 years. The tumor, of the size of a child's head and movable, was situated on the right side. It was removed by an abdominal incision along the outer border of the rectus muscle, which procedure was here preferred to that which the writer usually employs in this operation, or the lumbar incision which is used when the diagnosis is not entirely certain. The further course after the operation was favorable and the patient left the hospital cured. She returned, however, for œdema of the face and lower extremities with general weakness, but these symptoms disappeared after a few days' treatment. The further course of the case is unknown. The extirpated kidney was twelve centimetres long, seven in breadth and five in thickness. Five-sixths of the tumor consisted of an adeno carcinoma of the upper portion of the kidney. The tissue of the kidney was normal and amounted to two-thirds of a normal kidney. The tissue of the tumor was separated from that of the kidney by membrane, and the whole mass invested by the renal capsule. —*Svensk. Lakaresallsk. Forhandl.*, p. 51. —*Nordiskt Medicinskt Ark.* v., bd. 21, hft. 1.

VIII. Removal of a Vesical Tumor Through the Normal Urethra, After Preceding Location by Means of Cystoscopy. By DR. ANTAL (Germany). Antal removed three times tumors from the bladder per vias naturales, after preceding location by the aid of cystoscopy. The second and third case concerned the same patient (female). Antal succeeded twice in grasping and twisting off a tumor with the straight urethral forceps without preceding dilatation of the urethra. The tumors which he removed were papillomata. The repetition of the operation was not necessitated by recurrence but on account of development of an analogous growth at some other place in the same bladder.—*Fortschritte der Med*, bd. 8, No. 10, 1890.

IX. On Lithotripsy and Cystotomy. By DR. ED. SALVIA (Italy). The author reports on two cases of patients suffering from similar diseases, but in which he had to adopt two different modes of operative treatment. Both patients suffered from vesical calculus and also in consequence of a coxitis sinist., which had occurred in the third respectively fourth year of age of the patients, from dislocation of the femur upon the dorsum ilii. In the one patient, æt 23 years, the internal condyle of the left femur rested upon the middle of the right thigh. The affected side could not be moved actively at all; passive movement permitted the thigh to be lifted 15 cms. A common metallic catheter could be introduced by tour-de-maitre, while an assistant raised the left thigh. The deeper portion of the urethra and the bladder were dislocated to the right. The stone was removed by means of lithotripsy. The further course of this case was normal and recovery prompt.

The second case was that of a patient, æt. 45 years, whose dislocated femur rested upon the inner third of the right thigh. His pelvis was slightly inclined toward the left, but rotated in a high degree anteriorly and very asymmetric. In spite of repeated and different attempts to introduce an ordinary sound, Salvia did not succeed. Finally Gross's spiral metallic catheter could be introduced. This difficulty in introducing instruments was due to the considerable displacement of the

bladder. Salvia failing to introduce an instrument for lithotripsy, concluded to perform lithotomy. On account of the position of the left thigh, obesity of the abdominal walls and insufficient expansibility of the bladder suprapubic operation had to be excluded. Lateral incision had also to be avoided on account of the abnormal size and position of the ascending ramus ischii and the descending ramus of the pubic bone. The median incision was therefore adopted. A long piece of Nelaton's catheter was adjusted to the end of a lithotomy sound and, after several trials, introduced into the bladder; the operation upon the sound being thus rendered possible.

Recovery also took place in this case without complications—*La Riforma Medica*, 1890.

X. The Surgical Treatment of Ectopia of the Testicle.

By DR. TUFFIER (Paris). The writer comes to the conclusion that an intervention is justifiable in inguinal ectopia of the testicle in all cases where, after the fifteenth year, there is no tendency to spontaneous recovery. This intervention varies:

1. If the adhesions are apparently slight, massage causing descent of the testicle, fixation, by means of one or two stitches of silk, will suffice; the suture may be passed through the lower part of the testicle without any danger to the gland. Then a bandage may be applied to keep the testicle in position.

2. If this method fails, then recourse must be had to the bloody procedure: an incision is made, exposing the serous sheath and its contents, then resection of the vagino-peritoneal canal if it exists, or of its traces if it be obliterated; the testicle is then brought down into the scrotum and fixed to the septum. Fixation of the spermatic cord at the pillars of the inguinal canal he regards as a very important and useful step.

3. If the ectopia be accompanied by a hernia of the same side then the radical operation should be performed, the testicle brought down and fixed; in case of strangulated hernia in a young man this procedure was carried out.

Early age is a contraindication to operation.—*Gaz. des Hop.*, March 28; 1890.

ALBERT PICK (Boston).

TUMORS, ABSCESSSES.

I. **Two Cases of Actinomycosis in Man; Operation.** By DR. RANNEFT (Holland). 1. A man, *æt.* 20 years, who otherwise felt quite well, noticed since a few weeks, a swelling of his neck, which, however, did not trouble him very much. A short time before this occurred he had suffered from tooth-ache, which was caused by a carious molar of the left lower jaw. Slight dysphagia set in during the last days; otherwise the appearance of the patient was good. A hard tumor without distinct outlines, of the size of a walnut, somewhat sensitive to pressure, not fluctuating and on a level with the larynx, was to be detected on the left side of the neck. On account of enlargement of the tumor and increase of the dysphagia within the next few months, deep exploratory puncture was performed and an amount of pus evacuated. On incision pus was also found in the deeper structures. The operation was followed by drainage and appropriate dressing. Closure of the wound took place after one week. About four weeks later a new tumor of the size of a hazelnut appeared at the same place which was caused to disappear by the same treatment, after ten days. After about five months another swelling had formed at the same spot, on incision of which a whey-like fluid was evacuated, which contained numerous yellow granules; the latter having at most the size of a pin-head. The examination of these granules showed the case to be one of actinomycosis. Under anæsthesia the incision was enlarged, the cavity curetted and iodoform dressing applied. A perfect cure resulted, which even now (several months after the operation) continues. The point of entrance of the fungus was very probably also in this case the carious teeth.

2. Dr. Blok: This case, female peasant, *æt.* 54 years, who had very much to do with cows. She noticed since three weeks a swelling on the neck. The tumor was oval, of the size of a hen's egg, extended over the anterior aspect of the neck, from the right above downward to the left and covering in its median part the thyroid cartilage and the upper rings of the trachea. The tumor was adherent to the skin, which was cyanotic, very much infiltrated, but not glossy. At its peri-

phery the tumor was hard and there was fluctuation in the middle. The woman had frequently suffered from caries dentium, and had also now four carious teeth in her lower jaw and several stumps coated with tartar. The other organs showed nothing abnormal and there was no fever. A small enlarged lymphatic gland was noticed in the region of the right lower jaw. After incision of the fluctuating part of the tumor the evacuated pus was examined and actinomycosis filaments and gonidiæ were found. The proposed curetting of the diseased portion was not permitted by the patient; therefore, after evacuation of the pus and disinfection of the wound, an antiseptic dressing was only applied. The wound healed in eight days and no relapse has occurred after eight weeks. The swollen gland on the right side was still present, and its persistence was probably favored by the bad condition of the patient's teeth.—*Nidrl. Tijds. v. Genesk.*, 1889, ii, No. 20.

A. PICK (Boston.)

II. Case of Subcutaneous Intra-Muscular Echinococci.

By DR. ALEXANDRA G. ARKHANGELSKAIA (Golitzino, Russia). The author details the following rare case from her recent practice. A robust peasant woman, æt. 49 years, whom she had formerly treated for tertiary syphilis, applied on account of a "lump" on her back, of two week's standing. The tumor was painless, soft, covered with normal, freely movable skin and firmly adherent about the lower angle of the left shoulder-blade, being apparently embedded into the attachment of the infraspinatus muscle. A syphilitic gumma was diagnosed, and iodide of potassium ordered. In spite of the treatment, however, the tumor continued to grow. In a month it attained the size of a hen's egg, when it became evident that the growth consisted of individual small-sized soft and elastic nodules or lobes. On examination five months later (eight months after the first symptoms), the tumor was found to measure 29 centimetres in length and 19 in breadth, having extended both upward along the scapula, and downward to the axillary line. An exploratory puncture gave negative results, but was followed by the appearance of local redness, and pain on any movements of the limb. About a fortnight after the tapping, the tumor

burst and a large amount of serous fluid with numerous hydatids escaped, the bladders varying in size from a pea to a hen's egg. A number of collapsed cysts was subsequently removed by the author. In view of the appearance of a high fever and suppuration, the wound was enlarged 4 centimetres. A capacious purulent cavity became exposed, which contained numerous small pieces of dead bone, the outer and lower edge of the scapula, as well as a portion of the 8th rib, being found destroyed. After the removal of the fragments and a thorough disinfection of the cavity, fever at once subsided, pain disappeared, and a speedy healing ensued. When examined a month afterward, the woman was perfectly well, all movements of her left upper limb quite free. There remained only some decrease in the size of the left scapula, and a small scar adherent to the 8th rib.—*Meditzinskoie Obozrenie*, No. 12, 1890, p. 1120.

VALERIUS IDELSON (Berne).

III. Trephining of the Ilium for Iliac Abscess. By A. F. MCGILL, F.R.C.S. (Leeds). A girl, æt. 18 years, whose right hip-joint had been excised five years previously, complained of pain extending downward from the hip to the knee, which was not aggravated by moving the thigh. No fulness was found in the iliac fossa until three weeks later when an abscess there was successfully aspirated. The temperature still remaining hectic in character, the abscess was opened a week later above and behind the anterior superior spine of the ilium. On passing the finger into the abscess cavity, a piece of the iliac fossa the size of a sixpence was found to be denuded of periosteum. Over this point an incision was then made down to the bone, which was then opened by a trephine into the abscess. The suppurating cavity was thoroughly scraped and freely irrigated and drained. The result was perfectly satisfactory, rapid recovery ensuing.

The author remarks that this treatment may be of advantage when a collection of pus exists under the iliac fossa and when this collection is circumscribed and limited to the fossa. Pus in this position, when left untreated, will probably pass under Poupart's ligament and point in the upper part of the thigh, simulating psoas abscess. If they are

then opened or burst a long sinus will be left which will take a considerable time to heal.—*Lancet*, April 5, 1890.

JAMES E. PILCHER (U. S. Army).

IV. The Treatment of Fistula in Ano and Periproctal Abscesses. By DR. PAUL SENDLER (Magdeburg). The author has successfully practiced the following operation in eleven cases: The patient having been properly prepared by having his rectum emptied, is deeply anæsthetized, the parts shaven and a grooved director is then introduced in the fistula and the tissue divided. The hæmorrhage being arrested, the fistulous tract is eradicated with scissors, forceps, or knife. Diverticula and abscess cavities are laid open and the granulations scraped out. Then the wound is brought together by sutures. When there are large abscess cavities the etage suture is necessary—in smaller abscesses deep sutures only are used and they should be passed through the base of the wound.

The margins of the fistulæ are brought together in a similar manner, care being taken to suture the sphincter muscle. Finally the mucous membrane is sewn up.

In severe cases where a great part of the rectum is involved this operation can not always be performed, but the abscess cavity should be scraped and drained.

The dressing is simply iodoform sprinkled over the wound, and a pad of gauze held in position by a T bandage.

The patient is kept in bed for five or six days and opium administered to prevent the bowels from moving, at the end of this time the bowels are moved either by castor oil or by an enema.

If primary union has occurred the patient may be discharged in five or six days. In the severest cases the cure is usually completed in four or five weeks though the patient is always able to leave his bed in fourteen days.

In no case of the author's was the operation followed by incontinence of fæces.—*Deut. Med. Woch.*, No. 14, 1890.

F. C. HUSON (New York).

BONES, JOINTS, ORTHOPÆDIC.

I. Operations Upon Paralytic Joints. By Dr. KARENSKI. The author, referring to the operation of Albert (arthrodesis) in which the object is sought to produce ankylosis of the knee-joint in order that the lower extremity may become a support for the body, instead of a hindrance to locomotion, in cases of "dangle leg" from paralysis, states that the opinion is generally endorsed that if the function of the muscular apparatus attached to the joint is not restored in from 6 to 9 months the condition may be considered a permanent one. In view of this, interference, with a view of fixing the joint, and thereby restoring, in some degree, its usefulness, by means of Albert's operation, is to be considered a justifiable one.

While in the case of the lower extremity the limb can be restored to a condition of comparative usefulness by means of apparatus for facilitating locomotion, and, therefore, the operation may not be deemed one of absolute necessity, in the upper the case is quite different. Here the muscles of the shoulder proper being paralyzed, the entire upper extremity becomes completely useless, albeit the muscles which move the forearm still possess their function. By the aid of the pectoralis major and latissimus dorsi muscles, certain movements of the arm can be performed, but only in a slinging or jerky manner, but by fixing the humerus to the shoulder blade by an arthrodesis at the shoulder-joint, proper adduction and abduction movements of the arm may be obtained, and by means of the scapula the arm may be held in position.

In the case of the elbow joint this operation is only to be recommended when there exists absolutely no power of flexing the forearm upon the arm.

The operation heretofore has been most frequently performed upon the knee and ankle joint.—*Deutsch. Med. Wochenschrift*, 1890, No. 4.

F. C. HUSSON (New York).

REVIEWS OF BOOKS.

A TREATISE ON ORTHOPEDIC SURGERY. By EDWARD H. BRADFORD, M.D., and ROBERT W. LOVETT, M.D., Surgeons to the Children's Hospital, etc., Boston. Illustrated with 789 engravings. New York: William Wood & Co., 1890. J. H. Chambers & Co., St. Louis

This volume of 790 octavo pages is the most complete work on the subject of which we have any knowledge. As compared with this, former works seem as narratives of personal experience. The authors of this volume have wisely included all such subjects as are likely to come to the attention of those who interest themselves in this branch of surgery, without adhering too closely to the definition of the term, Orthopedic Surgery. They have given ample space to all recent work in pathology, a full exposition of all theories as to etiology, and a description of all forms of treatment that are worthy of consideration. As a scientific study of the subject the work deserves the highest praise, but as a bit of bookmaking, both on the part of the authors and the publishers, it is not what the reader has a right to expect. Writers of a "treatise" should not too frequently repeat themselves, nor so arrange their subject matter that it becomes necessary; nor should they be inaccurate in expression, or in error as to facts. And publishers of a six-dollar volume have no excuse for errors in proof-reading, or for illustrations that do not illustrate. Some of these faults we shall point out:

On page 8, should we not read *liability* for "inability"?

On page 321, are not the explanatory notes of Fig. 309 and Fig. 310 transposed?

In the text, illustrations are frequently referred to but not designated by number, and the cuts, in some instances, being placed on another page would be likely to result in confusion to one not familiar with the subject.

On page 376, we read: "The thigh ring is placed at an angle of 55° to the uprights, which angle is reduced by padding of the ring to 45° ."

Thomas says: "The ovoid ring should join the inner stem, forming an angle of 55° , which when correctly padded, becomes reduced to 45° ." However ingenious as a mechanic and skillful as a surgeon, Thomas does not always distinguish between angles, their complements, and their supplements; for as a matter of fact the ring of the Thomas knee-splint joins the inner stem at an angle of 135° (supplement 45°), which when properly padded becomes 125° (supplement 55°).

Again, we read: "The idea of using traction is not in accordance with the views of the inventor of the splint," whereas in the same paragraph from which the quotation on angles is taken (pp. 98, 99, second edition of *Thomas on the Hip, Knee, and Ankle*, 1876), Mr. Thomas speaks of cutting off "the staple," to which he attaches his traction straps while the patient remains in bed, and of welding on the patten for locomotion.

The first chapter treats of Pott's disease. The disease represents the result of a destructive osteitis affecting the spongy tissue of one or more of the vertebral bodies. This osteitis is tuberculous in type and follows the same course as tuberculous osteitis occurring at the epiphyses of the long bones, as in hip disease, tumor albus, etc. The treatment is by recumbency during exacerbations, traction in certain cases and under certain conditions, and fixation by means of some fixative apparatus, some form of the Taylor posterior steel splint being preferred. Taking the above into consideration we do not find any good reason for inserting the chapter on Pott's Disease before the chapters on Pathology, Etiology, Course, and Termination of Chronic Joint Disease, and separating it from Hip Disease when the pathology, etiology, course and treatment are admitted to be identical.

Chapter II. treats of Lateral Curvature of the Spine. We can not but think that the publishers would find it an excellent business venture to print these eighty pages as a monograph. Too much can not be said in praise of this chapter.

Chapter VI. takes up the subject of Hip Disease. The indications in the treatment of this disease are to furnish severally, fixation, traction (extension), and protection; to benefit the patient's general condition, to prevent and correct deformity, to allow locomotion as far as is compatible with the surgical indications, and to meet such complications (peri-articular inflammation, abscess, and sequestra) as may arise. For fixation the authors advise plaster-of-Paris or leather or metal splints; the Thomas splint; and some modification of the wire cuirass. For traction they advise some form of the "long traction splint" which is known under the name of the Taylor, or Sayre splint.

For protection, some form of the same splint, or Judson's ischiatic crutch.

The treatment of tumor albus of the knee is conducted on the same principles. Three modifications of the Thomas splint are shown, all designed to accomplish that which can be more perfectly accomplished by the splint as used by Mr. Thomas. The designers of these modifications (Figs. 339, 340, 341), have yet to learn the alphabet of Mr. Thomas' mechanics.

Every student of medicine recognizes the anatomical similarity between the hip and shoulder joints, and can readily understand that, if traction is beneficial in the treatment of chronic joint disease because of the distraction which it gives, it must be found more effective when employed in disease at the shoulder than in disease at the hip, inasmuch as the shoulder is more easily distracted than the hip; to such an one it will not be evident why traction is advised in the treatment of hip disease, and emphasized by 42 wood-cuts illustrative of apparatus designed to give traction, while in shoulder joint disease traction is not advocated, and no single cut illustrative of apparatus of any kind is given for guidance in this disease which, next to scoliosis, is the most difficult of all mechanical orthopedic problems.

The treatment of disease at the knee is illustrated by 13 cuts; the treatment of disease at the elbow by none. And it is difficult to understand why plaster-of-Paris is condemned at the knee, and advocated as the only means of treatment at the elbow.

The chapter on Club-Foot, which is limited to that variety known as equino varus, merits all the commendation given to Lateral Curvature. To review it without doing the authors a manifest injustice would require more space than it is possible for us to give. Much praise is also deserved for the chapter on Infantile Spinal Paralysis, and Cerebral Paralysis of Children; and a decided advance has been made in advocating the cutting of the resisting tendons in the latter condition. Of the chapters on Rickets, Bowlegs, and Knock Knee only good words can be said.

In looking back over the book as a whole we can only venture two words of criticism: First, inasmuch as the details of the operative procedures herein advocated can be found in any standard work on general surgery, would it not have been better to have given more minute details as to the measuring for, ordering, fitting, and adjusting, and if necessary manufacture of the various apparatuses recommended? Descriptions like the following are not clear to the average mind: "The traction splint consists of a rod, hollow at the lower part, with

teeth cut on the edge into which the rod plays, by means of a key. This rod can be moved up and down, and it is caught and held in place by means of a spring, and sliding catch." Second, the illustrations appear to be of three classes, namely, of those that well illustrate the text of the authors, of these there are not enough; of those made to illustrate the work of some other surgeon, of these there are too many and they no more deserve publication than the work they were intended to illustrate; and lastly, of illustrations stamped with the name of the surgical-instrument maker, and sometimes devised and used solely by that selfsame individual whose knowledge of the indications for the treatment of diseased conditions is no greater than his knowledge of anatomy. This appearance of a surgical-instrument maker's catalogue can not but be an unwise economy on the part of the publishers, as it is a matter of chagrin to the authors.

To the reader of this review, we would offer one word of advice: Go and buy the book. It is deserving of the most careful and painstaking study.

JOHN RIDLON.

CHIRURGISCH-ANATOMISCHES. VADE MECUM. Studierende und Aerzte. von W. ROSER. Achte sorgfältig umgearbeitete Auflage, besorgt von Dr. KARL ROSER. Leipzig: Veit & Co., 1890. New York: G. E. Stechert.

GUIDE TO SURGICAL ANATOMY.

But a short time ago we had occasion to notice the seventh edition of this popular little work. Since then its author has passed away, and the present, eighth, edition is written by his son, who, for many years, assisted his father. The same method of teaching surgical anatomy, that of fenestrated incisions and dissections is, of course, adhered to, and much of the text, at least one-fourth, has been rewritten. Much of the terminology has been altered, so as to correspond with that of Henle; and a few new wood-cuts have been inserted. Some remarks applying to rarer forms of surgical dislocations, etc., have been omitted, as unnecessary; but, in the opinion of the present writer, to the detriment of the work. W. W. VAN ARSDALE,

THE QUESTION OF THE PROPRIETY OF RESORT-
ING TO ARTHROTOMY FOR SUTURING
RECENT SIMPLE FRACTURES
OF THE PATELLA.

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IN THE course of a discussion at the Brooklyn Surgical Society in 1888, I expressed the following views: "that a surgeon who had become a master of the practice of anti-sepsis, as well as its principles, and who is able to control with certainty the conditions which surround his patient, would be justified in opening the knee joint in a recent case of fracture of the patella, for suturing the fragments together, but that I doubted whether, excepting under such circumstances it would be justifiable."

I find, however, that in the most recent manual of surgery, which is just from the press, Roberts' Manual of Modern Surgery, the author declares, without qualification: "The treatment of fractured patella by wiring the fragments, and the management of cases with long fibrous union by resection and wiring are not justifiable. The disability resulting from imperfect connection of the fragments is not great enough to warrant the additional though slight risk to life assumed." Wyeth also, in his Text-book on Surgery, 1887, says, "the most unjustifiable method of treatment ever introduced in this fracture is that of opening into the joint and wiring the fragments together. Unjustifiable because, first of all, it is dangerous; secondly, because it is unnecessary." And W. T. Bull, in reporting the "Results of the Non-Operative Treatment of Fracture of the Patella," as obtained by him in twenty-two cases, takes occasion to condemn without exception wiring in recent

fractures, and challenges those surgeons who resort to the immediate suture to explain by what process of reasoning they can call it a justifiable procedure.

These all are authorities for whom I have the highest respect. The unqualified rejection which they unite in giving to the procedure in question has caused me to again carefully consider whether my own rather conservative position taken three years ago was not after all too radical.

One thing, however, I note in examining the grounds upon which this operation is condemned by the gentlemen named, viz., this, that their own experience with it has been either very limited, or very unfortunate, or both. Dr. Wyeth states that in 1881 he wired a fractured patella on the twentieth day after the accident, in the case of a woman, æt. 20 years; but that notwithstanding the strictest antiseptic precautions, including free drainage, destructive inflammation of the joint ensued with abscesses in the thigh, and the patient barely escaped with her life after amputation in the lower third of the thigh. He does not seem to have ventured upon the operation since that experience. Dr. Roberts has not recorded any case of the operation.

Dr. Bull reports but one case of arthrotomy, in cases of simple fracture of the patella, that one being for the repair of an old ununited fracture; in this case the operation was followed by suppurative arthritis and thigh abscesses and ultimate death.

The well known statistics of Brunner and of Dennis, however may be supposed to present material enough for forming a judgment, without the incurring of fresh and repeated hazards by new operators. Brunner, it will be remembered, in 1885 (*Deutsche Zeitsch. f. Chirg.* Bd. 23, s. 23; *Annals of Surgery*, 1886, vol. iii., p. 439) collected from all sources the particulars of 45 cases of recent fracture in which open arthrotomy with suture of the patella was done, and in 8 of these dangerous suppurative inflammation of the knee-joint followed, two terminating fatally, and two others saved by amputation. In 45 cases of old ununited fracture operated upon, reported by the same author, purulent inflammation ensued in 11, neces-

sitating amputation in one case, and resulting in death from pyæmia in three instances.

Dennis reported in the same year, 1886, from a search through the literature of the subject, details of 186 cases of arthrotomy and suture of the patella in both recent and old cases, 34 of which were complicated by suppuration, 4 required amputation, and 11 terminated in death. Nevertheless this same surgeon, Dennis, was able to report in April, 1880, (*N. Y. Med. Jour.*, 1890, June 14, p. 666,) that he himself had up to that date personally wired over 30 patellæ, and that in no case had life been jeopardised by the operation.

Lest this more favorable experience of Dennis should be supposed to be due to the specially favorable character of the cases or of the conditions in which these operations were done the equally favorable results obtained by other surgeons of New York during the same period is to be considered. Thus Dr. Stephen Smith reports 15 cases, Dr. Fluhrer 16 cases, and Dr. Chas. Phelps 44 cases, all without serious suppuration and without a death. Indeed most notable contributions to the subject have been made during the past year by Drs. Fluhrer and Phelps, especially by the latter in a paper read before the Bellevue Hospital Alumni Association, April 8, 1890. (*N. Y. Med. Jour.* May 31 and June 7, 1890). Lucas-Championniere (*Jour. de Med. et de Chirg. prat. Mars*, 1890) has also reported during this year a series of 14 cases, all likewise pursuing a favorable course without suppuration and securing firm bony union in the fractured patella.

The rational basis for immediate arthrotomy in recent fractures of the patella was established by Macewen in his observation first published in the *Lancet* in 1883, and further elaborated and reinforced in a contribution to the *Annals of Surgery* in 1887 (Vol. v., p. 177), in which he demonstrated that a frequent hindrance to bony union in fractures of the patella existed in the infolding and entanglement between the fragments of portions of the præpatellar aponeurotic structures. Mr. Macewen reported at that time 8 cases in which he had opened the knee-joint after fracture of the patella, in all of which he had found the conditions first mentioned, and in all of which, after clearing away the interposed structures and sut-

uring the fragments together, speedy, uncomplicated and firm union had taken place.

In connection with the present discussion, being desirous to know whether additional experience had in any way modified the views or practice of this surgeon, I addressed him a letter of inquiry on the subject, to which he replied as follows, under date of Sept. 1, 1890:

"I have had 13 opportunities of operating for transverse fracture of the patella. In each I have exposed the parts as soon after the reception of the injury as was permitted. In each there were intervening structures between the fragments which would have prevented osseous union, and in each, after these were raised and the bones brought together, firm, and, we believe, osseous union was obtained. Wounds healed aseptically and the patient was allowed up in six weeks, with slight splint. The movements afterwards in eleven were excellent, the limb being firm; several patients whose occupations were hazardous trusted their lives daily to the steadiness of their lower limbs. In a case of strong rheumatic habit, there was limited movement to about arc of 30° though wound healed aseptically, and in the thirteenth case there was a slight degree of stiffness. Both of these had sound limbs and could go up and down stairs easily. Under these circumstances I adhere to opinion formed in 1887."

Now up to the present date the experience of the six gentlemen just cited aggregates 132 cases, with uniformly favorable course of healing and with functional results unequalled by any other similar series of cases. Not all, but a very large proportion, of these were cases of recent fracture, having been operated on at periods varying from a few hours to 14 days after the injury.

It is of interest to know the final judgment as to the justifiability of this operation of these surgeons who have had the most experience. Macewen's has just been given. Stephen Smith says he has great confidence in the ability of the surgeon to operate without any serious results to the patient, but in view of the good results obtained by the ordinary method of treatment, he would be inclined to limit the operation to cases of refracture. (*N. Y. Med. Jour.*, June 14, 1890,

p. 667). Dennis is of opinion that the operation has the two advantages of (1) simplicity and (2) rapidity of cure, and that it does not require any special skill in its technique beyond that involved in the application of the general principles of antiseptic surgery. He considers that the knee-joint presents a very good field for antiseptic surgery. Championniere (*loc. citat*) says that this operation appears to him to constitute an ideal one. The remote results and the immediate effects find in it equally and at once their remedy. It is the most perfect type of treatment. It should be applied in every case except those in which some grave cachectic state, as diabetes or albuminuria, contraindicates any operation. Fluhner believes it to be the duty of the surgeon, in case of recent simple transverse fracture of the patella (adequate skill being granted, and, subject to certain qualifications) to open the joint and suture the broken fragments, unless he can insure his patient a good result by the non-operative method, with freedom from crippling of the limb and the other disabilities potentially belonging to an imperfectly reconstructed knee-joint. Phelps says: "If the knee-joint can not be opened with safety, then aseptic surgery is a delusion and a failure. If we have faith in its theory and practice, it is cowardly to deprive our patients of all the advantages which may follow its acceptance. The demonstrated results of this operation are so far superior to those of other methods of treatment that its adoption becomes a matter of obligation, at least in these cases of recent fracture in which no contraindication is apparent."

It is apparent, as we view this whole question dispassionately, that the justifiability of arthrotomy and suture of the patella after fracture depends entirely upon the reliability and adequateness of the resources which surgeons possess to prevent septic infection of the wounds made. Now this cannot be a matter of theory, it is a matter of experience and practice; 44, 30, 16, 15, 14, 13 consecutive cases, in the hands of different surgeons, in which the knee-joint is widely opened and the constituents of the joint are freely handled for considerable periods of time, and all with immunity from septic infection, is sufficient demonstration that reliable and adequate precautions against harmful sepsis are possible to be obtained

by sufficient care and knowledge. And, *per contra*, the disastrous suppurations, entailing many times amputation or death, that have been reported from other observers, show the results that may follow imperfect antiseptic details, and warn against the indiscriminate practice of the operation.

There are two questions which must especially engage the attention of the surgeon when confronted by a fracture of the patella, *viz.*: (1) what amount of disability is probable if non-operative methods are employed, and (2) what risk is entailed if arthrotomy and suture is done? Both questions will be answered differently by different surgeons, and each answer may be equally conscientious and worthy to be respected. Thus we have, introduced into this question, and necessarily playing an important part in its settlement, the personal equation of the surgeon himself. I think that I have seen on the part of those who condemn arthrotomy and suturing a tendency to minify the disabilities resulting from fractures of the patella as ordinarily treated, and to be content with an imperfection of function that in reality is far from being an ideal result of treatment. Nor have I any unfavorable criticism to make of this tendency, for a somewhat rose-colored view of the result of his treatment may rightly be entertained by a surgeon when he is persuaded that it is the best result that he could obtain in the case. The fact that a patient is satisfied with the result is not in itself any evidence of its perfectness, for it is natural for a person who has met with this accident to fear great disability as its consequence; the prudent surgeon is not likely to promise too much as he undertakes the treatment, and so the final result, being better than the fears of the patient and the promises of the surgeon, is cheerfully accepted by the patient, who congratulates himself that he is as well off as he is. Good results from non-operative treatment demand prolonged treatment; Bull, whose results were exceptionally good, keeps on his splint for from three to four months, and does not expect to obtain his greatest functional recovery under one year. Wyeth advises a long splint for six months, and would apply a flexion-check apparatus thereafter to be worn for twelve months more. But however tedious and prolonged the treatment, however satisfactory or disappointing

the result, one great advantage attends it throughout, viz.: this, that the life of the patient has not been put to hazard in its course.

After all that has been said about the results possible from non-operative treatment it is not probable that any future writer will be able to express any more judicious and truthful opinion in this matter than was given by Frank Hamilton, at the close of his career, when he says: "The fact seems to be that more or less loss of freedom in the motions of the joint, and of strength and stability in the limb, remains in the majority of cases for a long period of time, and often during life; but that in a few exceptional cases, where the separation does not exceed one inch, the functions of the limb are completely restored within one or two years."—(*Treat. on Fract. and Dis.*, 1880, p. 513.)

As long as surgeons labored under the idea that failure of bony union after fracture of the patella was due to the inadequacy of their apparatus for keeping the fragments in coaptation, it was natural that surgical ingenuity should be taxed to its utmost to overcome the fancied forces that tended to draw the fragments away from each other. The first arthrotomies in cases of fractured patella were doubtless done by surgeons with the primary object of securing this coaptation by the more reliable means of the wire thread. Then first was demonstrated that the real cause of non-union was the almost constant interposition of fibrous tissue between the fragments. The original observations of Macewen have been corroborated by many other surgeons who have opened the knee-joint in recent fractures of the patella. Phelps, whose experience is the greatest, states that in every primary fracture he found the longitudinal aponeurotic fibers which cover the bone interposed to a greater or less extent between the fragments. Fluhrer makes practically the same statement, and Championiere, after describing the state of the interior of the knee-joint, as disclosed in his operations, says, "one understands that in removing all these clots, cleansing the synovial cavity, and freeing the fragments of the foreign matters which encrust them, the articulation is in a fashion reconstructed. One then realizes well why the hopes of those surgeons are vain who attempt

only to effect coaptation of the fragments. They can do nothing to remedy the state of the articulation itself; this coaptation even is not possible in the immense majority of cases."

Thus within the past few years an entirely new light has been shed on the pathology of fractures of the patella, and a new indication for treatment has come to dominate the scene. I will venture here to record my conviction that sufficient evidence has now accumulated to establish beyond question, as an almost constant occurrence, a sufficient interposition of fibrous tissue between the fragments of the patella to prevent bony union. With this demonstrated as a fact, a new question will hereafter have to be answered by surgeons when confronted by a broken patella, which will be something like this, Am I doing my whole duty by this patient if I make no attempt to remove this obstacle to union which I am morally certain is interposed between these fragments, and abandon him to at least a short ligamentous union, to probable considerable permanent disability and to possible grievous lameness for the remainder of his life?

As long as the disabilities recognized as following non-operative treatment of this injury were accepted as unavoidably inherent in the nature of the injury itself, the surgeon might properly content himself with traditional methods of treatment, but with the demonstration of a definite and positive cause for these disabilities, susceptible of removal, a powerful incentive is supplied to adopt those measures which will remove this cause unless it shall appear that these measures are likely to introduce serious dangers of their own.

The whole question hinges therefore on the risks inherent in arthrotomy and suture. What are they? The operation itself is simple in its nature and easy of execution; the dangers from shock and hæmorrhage are too insignificant to be taken into account. Septic infection, with its train of evils, is the one danger to be considered. Are the dangers from sepsis unavoidable, or avoidable? All surgeons are now agreed that they are avoidable by the adoption of certain precautions which have become well known and established as tenets of surgery. For the certain practice of these precautions careful training, much practice, and unremitting watchfulness is re-

quired. Certain accessories in the way of material and surroundings are likewise requisite.

None will gainsay that theoretically arthrotomy and suture can be done by surgeons so equipped by training, by practice, and with the needful accessories, without risk of serious detriment to the patient. As has been shown in the earlier part of my remarks, this has really been done in hundreds of cases. A logical conclusion from all that has been said is that it would be desirable that all patella-fractures should come under the care of surgeons so equipped.

Practically, however, the uncertainties of antiseptic work as usually done are known to be so great as to abundantly justify the apprehensions entertained by most surgeons as to the dangers attending the procedure in question and to prompt them both to refuse to employ it themselves, and to discourage its employment by surgeons in general.

This, however, in view of the unquestioned results of careful work on the part of a few, must be regarded after all as in some sort a shrinking from responsibilities which might fairly be undertaken by a thoroughly equipped surgeon.

If, as seems to have been demonstrated beyond a peradventure, arthrotomy and suture in the treatment of recent fracture of the patella is the most perfect method of treating that injury that our present knowledge of its pathology and of the possibilities of modern surgery presents to us, then it ought to be recognized as such, and the essentials for its successful practice should be clearly established and taught. Certainly there is no operative procedure which puts to a more severe test the perfectness of a surgeon's precautions against sepsis. There are doubtless as yet comparatively few by whom it ought to be done, but the number of those who can and will do it in the future will certainly greatly increase. I think therefore that the authors of recent surgical manuals, whom I have quoted, are open to criticism in having denounced this operation in such unqualified terms. For themselves they have a right to reject it; for others they have a right to advise against it, but to declare it baldly unjustifiable, is itself, in the light of our present knowledge and experience, hardly consistent with the progressive spirit which usually marks their teachings.

It is not the object of the present communication to discuss the technique of the operation; this has been recently very fully elaborated by other writers, especially by Phelps; nor to speak of the contraindications which special cases or conditions may present. The general state of the patient, pre-existing constitutional conditions, the existence of other injuries, the character of the local injury in cases of direct violence to the knee-joint, all these must be taken into consideration by the surgeon in forming an opinion as to what is proper to be done in an individual case. Nothing in what has been said is to be taken as suggesting in the least that all these considerations, which a surgeon weighs well in all his other work, are not to be equally weighed in connection with fractures of the patella.

During the last two and a half years I have myself treated all the cases of fracture, of patella, six in number, that have come under my care, by arthrotomy and suture, with one exception.

All these cases have been treated in the Methodist Hospital. The case in which arthrotomy was not resorted to was that of a man, æt. 55 years, a tailor by occupation, who was sent to the hospital by his physician, Dr. Wm. Anderson, for the special object of having arthrotomy done. Upon examination, however, the tendency to separation was found not to be great; there was but little effusion into the joint; the damage to the capsule of the joint was evidently slight, so that there was reason to expect the best possible result from non-operative treatment. In addition his sedentary employment and his age made it a matter of less importance that absolute restoration of the full function of the joint should be secured. For these reasons in this case I contented myself with encircling the patella by a silk thread passed subcutaneously so that when the two ends were drawn upon and tied the fragments were held closely and securely together. The knee was then supported by a posterior plaster splint for eight weeks, at the end of which time all support was discarded. Firm union of the fragments resulted. A slight line of depression at the site of the fracture was perceptible when he was discharged, which was the only indication of the fibrous nature of the union. I

learn that the subsequent separation, after eighteen months, is very slight, not more than a quarter of an inch, while the function is good.

The cases of arthrotomy and suture are as follows, in the order of their occurrence:

CASE I.—Male, *æt.* 48 years. A house painter. Fell from a ladder and sustained a comminuted fracture of the right patella by direct violence presumably. Arthrotomy on the third day after the injury revealed a transverse fracture of the patella near its middle, lower fragment again broken into three pieces, shreds of fibrous tissue covering fractured surface of upper fragment. The joint was cleansed by irrigations with boro-salicylic solution, and the fragments after being properly cleared, were sutured together with silkworm-gut. Drainage from the joint cavity by rubber tubes for one week. Incision closed with catgut. Posterior plaster splint for five weeks. The case pursued an afebrile course, the operation wound healed by primary union. The patient was discharged at the end of six weeks with close and firm union in the patella. The movements of the knee were still somewhat restricted, but were steadily improving. I have not seen the patient since.

CASE II.—Female, *æt.* 20 years. A domestic. Patella fractured seven weeks before admission to hospital. No special treatment at the time. When admitted the fragments of the patella, which had been fractured transversely near its middle, were separated two and a half inches with no band of union. Marked disability. Arthrotomy. Broken surfaces of fragments covered by dense fibrous and cicatricial layer. These surfaces were refreshed; owing to contracture of quadriceps muscle it was impossible to bring the upper fragment down for coaptation to its fellow until after multiple partial transverse incisions of the rectus muscle had been made. The fragments were then sutured together with silkworm-gut. Rubber drain from joint for one week. Subsequent afebrile course of healing. Primary union in wounds. Firm and apparently bony union of fragments. Discharged at end of eight weeks, when motion at knee-joint was still quite restricted. When seen some months later, much improvement in range of motion had been obtained, and the union of the fragments remained secure.

CASE III.—Female, *æt.* 24 years. A domestic. Transverse fracture from indirect violence. Fragments widely separated with free tearing of the capsule. Arthrotomy on the third day. Fractured sur-

ace of upper fragment found to be covered in by a fibrous fold derived from the prepatellar aponeurosis; the joint filled with blood clot. Fractured surfaces cleaned; all shreddy torn material trimmed away; toilette of the joint made, and the fragments sutured together with silver wire. No drainage. Etage suture to capsule and operative wound. Posterior plaster splint. Subsequent afebrile course of healing. Primary union in wounds. Splint worn for five weeks. At end of six weeks began to walk about. Motions of joint considerably restricted when splint was first removed, but progressive improvement was manifested up to the time of her discharge from the hospital at the end of nine weeks. Firm and apparently osseous union in the patella was present.

CASE IV.—Male, æt. 40 years. An expressman. Transverse fracture of the patella from indirect violence; with separation of $\frac{3}{4}$ inch. Arthrotomy on the 4th day. Joint cavity filled with blood clot; shreds of fibrous tissue partially covered fractured surfaces; everything cleared away, with toilette of the joint; fragments sutured together with silver wire; a single rubber drain for five days. Posterior plaster splint. Afebrile course of healing. Primary union in wounds. At end of three weeks splint was removed, and firm apparently bony union of the fragments was present. Before the end of the fourth week patient was walking about the ward and during the fifth week went home able to freely flex and extend his leg.

CASE V.—The fifth case is a continuation of the history of Case IV. After returning home he engaged in light work without inconvenience, until one night while walking across a room hurriedly in the dark he struck the same knee violently against a chair, and again fractured his patella. For two weeks he delayed submitting to any treatment, having but little pain in the knee, and being annoyed chiefly by the loss of power to extend the limb. He finally again applied at the hospital for relief, the fragments having become separated to the extent of $1\frac{1}{4}$ inches. Arthrotomy was again done on the 18th day after the injury. The line of fracture through a little more than half its course was at the site of the primary fractures; it then deflected from it obliquely downward through the rest of its course. The fractured surfaces throughout presented the same appearance of recently broken bone after they were cleaned of the crust of mingled blood clot, plastic exudate and fibrous fringes with which they were covered. The fact of complete bony repair of the fracture was absolutely demonstrated. The original wire sutures were found attached to one of the fragments, one suture having been broken and the other having torn out, its loop being still in-

tact. The fragments were easily brought together, and after the toilette of the joint, were secured again by sutures of silver wire. A single rubber drain upon the joint for five days. Posterior plaster splint. Subsequent afebrile course of healing. Primary union of operative wounds. At end of five weeks the patella is firmly united and the patient is allowed to walk with a cane, and is advised to use a flexion-check posterior splint for perhaps three months.

IN WHAT CLASS OF WOUNDS SHALL WE USE DRAINAGE?¹

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IT has been stated upon high authority that the drainage of wounds marked an era of advance in the methods of wound-treatment equal to that of the introduction of antiseptics. The differences of opinion which still pertain are so marked that the question of drainage in operative wounds is one of primal importance, and I have presumed to call attention to it, in the hope that our surgical science is, at least, so advanced as to permit the formulation of certain general rules for guidance. It may be accepted that the object of drainage is to safely remove deleterious substances from a wound which, if allowed to remain, will in a greater or less degree, retard cure, or even endanger life.

These substances consist, on the one hand, of blood, serum and devitalized tissues, and on the other, of vital organisms, known earlier as ferments, consisting of various forms of bacteria which utilize these materials as food, and may reproduce, with a rapidity and degree almost beyond comprehension. These low orders of vegetable organisms not only thus become dangerous in themselves, but they generate a chemical poison which may be sufficient in amount to produce death.

To what degree are the living tissues endowed with a resistant power for self-protection from such danger, is a question to be answered with difficulty, perhaps never subject to precise solution. It is settled beyond doubt that the healthy tissues have a resisting power to prevent, to a certain extent, the

¹Read at the meeting of the American Association of Obstetricians and Gynecologists, Philadelphia, Sept. 17, 1890.

invasion of bacterial infection, and that this is, in a more or less direct ratio to the physical vigor of the individual, age, condition, etc. It will also not be questioned that an occasional bacterium, implanted upon healthy tissues, will not germinate, and it may be formulated that when the vital resistant power is greater than that of the foreign element, the latter will not thrive. Such illustrations are often met in wounds subject to local infection only, where the recovery is slow and the resulting abscess causes the expulsion of the foreign material, healthy granulating cells at length filling in and uniting the tissues.

It is also clearly established that this same vital force is quite capable of dealing with, and in the end, utilizing for repair considerable effusions of blood and serum, as well as broken down tissues, so often seen in subcutaneous wounds, simple fractures, and other severe injuries. However, change the conditions by the introduction of a micrococcal infection, as in a compound fracture, and it is quite possible that this same resistant power may be no longer able to save the general organism from destruction, and death may result from septic poisoning.

From this brief review of well known facts, it is obvious that the real object of drainage is not so much the removal of the serum, blood, and devitalized tissue, as it is to remove any possible bacterial infection which may have invaded the wound, for it is quite impossible to divide and rejoin tissues without the effusion of blood and serum, and in a greater or less degree devitalizing the adjacent tissues. Since these are very important factors, it is of the first consideration on the part of the surgeon that he minimize, as much as possible, these conditions for the reason that they render it very probable that the introduction of bacterial *seed* into such a *soil* will be followed by direful results.

Is the present state of operative procedure sufficiently accurate to warrant the assurance that such complications are not to supervene, is the question which must first be satisfactorily answered, before we are in a position to determine at all positively, when we are to use, if always, or not at all, the drainage tube, and hope thereby to remove the fermenting

material so dangerous if allowed to remain. It is certainly clear that the experience of the last twenty years has been leading to the solution of this problem, until now it seems demonstrated beyond a doubt that an *aseptic* wound may be made in *aseptic* tissues and maintained *aseptic*, until restoration is complete. If this is true, the *modus operandi* of modern wound treatment must be mastered as the ritual service of a higher religion, before the surgeon is competent to enter upon his duty in the field of operative surgery. This portion of the subject would lead one too far from the theme of present consideration, but, fortunately, the members of this society need little instruction in this direction.

If aseptic conditions are maintained, then we may safely conclude that the drainage of the wound will not be necessary, and if unnecessary, certainly undesirable. At the best, the drainage tube is a foreign body and its presence in the wound prevents primary union of that portion of the tissues which encloses it. It keeps the wound, to a certain extent, an open one, and, as such, makes secondary infection so probable that the most careful dressings are advised to absorb and disinfect secretions and prevent atmospheric contamination. In an aseptic wound, after the removal of the tube, the final closure of the tract is comparatively slow, and by granulation. These are well recognized objections, and efforts have been made to overcome them by many ingenious devices. The bone drainage tubes are of service to this end, since after serving the purpose of a drain for a time, they soften and, as broken-down material, escape into the dressings. A modification of these tubes has been made by Dr. Weeks, of Portland, Me., possessing certain advantages over bone, in the use of the arteries from animals which have been aseptically prepared. They serve an excellent purpose when such drains are required.

If drainage is to be discontinued in aseptic wounds, it must be accepted that all possible care is to be exercised in having *as little devitalized tissue as possible*, and in *evenly coapting the divided parts*. The wound should be clean and dry. The different layers of the tissues should be joined with as little injury to them as possible, and the external wound protected from infection. This I have found best carried into effect by

irrigation, a minimum of sponging, and joining the tissues by light running buried animal sutures, preferably fine tendon. The skin is evenly coapted by a similar suture taken from within outward through the deeper layer only. Then the wound is sealed with a germ-proof layer of iodoform collodion, reinforced by a few fibres of cotton. Such wounds go on rapidly to repair without œdema of the tissues, pain, or tenderness. The resulting cicatrix is minimized, of much importance in facial wounds, and often is scarcely, after some weeks, to be recognized.

Are all aseptic wounds to be thus treated? I unhesitatingly say, yes, even to the major amputations, and in a large proportion of laparotomies. Can such large wounds be made and maintained aseptic? Without a doubt, as experience abundantly proves; however, by the most scrupulous of aseptic measures. When in doubt, it may be better to drain large wounds, but I cannot myself question that he who uses the drainage tube in aseptic wounds, unconsciously, however it may be, thereby, in a measure at least, confesses his lack of confidence in his belief and ability to maintain an aseptic condition of wounds.

The wound which is cleansed with difficulty from blood, or where there may be possibly unsecured bleeding points, may become an exception to the above rule, even if aseptic, but here the drainage-tube, when used, is for quite another purpose; in order to point out secondary hæmorrhage, as after severe abdominal operations with many injured vessels. I cannot myself, however, doubt but that it is far better to use especial precautions to control hæmorrhage before closure of the wound, rather than rely upon such an imperfect indicator of subsequent complication. As a matter of fact, I find, in my last forty abdominal sections, I have not once used drainage, and have noted no reason to regret not doing it.

In *septic* wounds we have entirely other conditions, and here we shall find abundant reason for the use of drainage. In an abscess, as illustration, the proliferated wall of protective cells is often invaded by colonies of bacteria, and the simple washing with antiseptics is not sufficient to destroy fermentation. Here it is of much importance to remove as rapidly as possi-

ble the albuminoid secretions and broken debris, to allow the cavity to contract, and when this takes place the surrounding tissues rapidly become of increased vitality, while the bacteria, robbed of nutrition, soon die and disappear.

When tissues, otherwise healthy, have become contaminated by infective material, as, for instance, the rupture of a pustule in the pelvic cavity, we can never be certain that our antiseptic washes have disinfected all the peritoneal folds, even if applied with care, and here drainage should be used. The irritation which follows such operations will cause serous effusions and this, with the blood and dead tissues, always in some degree present, will furnish abundant pabulum for bacterial growth. Here it is important, not only to use a drainage-tube, but to be explicit in the care of the same, for at least the first two days after operation. Properly used, it should be long enough to reach to the bottom of the cavity of the pelvis, to the posterior cul-de-sac. It should contain lateral openings, and the attendant in charge should for the first hours empty the same every few minutes by the use of absorbents, cotton on wire gently used answering every purpose. This makes, as it were, a continuous flow from the surrounding tissues toward the bottom of the drain and removes the fluids before time for fermentation has elapsed. After twenty-four hours the quantity will have greatly diminished and a capillary drain of gauze will be sufficient, changed occasionally. It is better, when all goes well, to remove the tube altogether by the third day. Occasionally small portions of omentum are drawn into the openings of the drainage-tube by suction, and thus closure takes place, but rotation of the tube is quite sufficient to disengage them. When tubes are used, antiseptic absorbent dressings are of importance, and position should be made available as far as possible in aiding the outflow of the secretions.

If the conclusions above arrived at are correct and based upon scientific data, in what way are we able to explain the great differences of opinion and practice at the present? At the recent International Medical Congress in Berlin, both Mr. Tait and Dr. Bantock expressed their disbelief in germs as an

important factor in wound treatment, while they strongly urged the importance of the early and rapid removal of blood, serum, and devitalized tissue from wounds. On this account, they not only use the drainage-tube as in common practice, but predicted its more general adoption in the early future. Mr. Tait very properly emphasized the power of the tissues to protect themselves, when vitalized, if placed in favorable conditions, and I take the greatest pleasure in seconding the views of this noted surgeon; to use an illustration drawn from agriculture, the proper care of the *soil*, while I trust he will not be forgetful of the *seed*, which is, after all, an equally important factor in the direful harvest.

The conditions for growth must be fitting. To destroy weeds, as well as to grow the grain, a primal knowledge of their reproduction is necessary. As well think of reading an essay upon agriculture over a peck of corn, poured upon Boston Common, and expect an abundant harvest, as to confidently look for good results in wound treatment without a knowledge of all its possible factors. The *seed* and the *soil* and the varying conditions of *each* must ever be kept in consideration. When in doubt of infection left in a wound, especially when its character will be likely to be attended with an abundant albuminoid secretion, drain; but let the surgeon ever remember that the highest ideal condition of wounds is their restoration to, as nearly as possible, the normal relations of the tissues, and their retention at rest in an aseptic condition. This should, in the great majority of wounds, render drainage not only unnecessary, but when applied it will be a positive detriment and a source of danger. Complete closure of an aseptic wound by buried aseptic animal sutures, retained at rest by a germ-proof dressing, comes nearer to the ideal than any method yet advised. There is no fear of hæmorrhage in a wound thus closed; if aseptic there is no further danger from infection. Clumsy antiseptic dressings are entirely avoided; little subsequent care is requisite on the part of the surgeon or attendant, and a patient, relieved of fear from the suffering from removal of stitches, free of pain, goes on to a rapid convalescence. I am assured that the better knowl-

edge of the conditions of wounds will restrict the use of the drainage-tube to septic wounds, and that operative wounds in aseptic tissues will be aseptically maintained by primary closure without drainage.

CUNEIFORM OSTEOTOMY FOR CONGENITAL TALIPES VARUS. REPORT OF SEVEN OPERATIONS.

By A. C. LAMOTHE RAMSAY, M.D.,

OF ST. CLOUD, MINN.

SURGEON TO ST. BENEDICT'S HOSPITAL.

THESE seven operations were on patients varying in age from 1 to 15 years; all had been tenotomized early without the least benefit, and in Case II with manifest injury, ankylosis of ankle having been the result of an erysipelas which followed tenotomy. All were congenital cases.

As to the causation of the congenital form, I think the nervous or centric origin, as advanced by Malgaigne, Ball and Delpech, is the most tenable (Enc. Dis. of Child, Keating, pp. 956). The theory of pressure is very faulty. I have noticed twice that in acephalous monsters talipes varus existed. In one I made a dissection of the feet and the deformity of the bone was very marked.

All these operations were performed in my service in St. Benedict's Hospital, with the most rigorous antiseptic precautions.

Case I.—Congenital talipes varus of right foot. Walks on side of foot.—Pius R., æt. $3\frac{1}{2}$ years, born of healthy parents, was first tenotomized and put in a plaster cast when a year old. No improvement at the time that he was sent to me by Dr. H. A. Pinault, of St. Michaels, Minn.

Operation August 29, 1889 Ether anæsthesia. Foot was washed with a solution of ether and iodoform $\frac{1}{20}$. Esmarch bandage applied and an incision from the external malleolus to the middle of the fifth metatarsal bone was carried down to the bone. The periosteum was reflected and a V shaped piece of the tarsus, including the anterior portion of the astragalus, was cut out with a sharp chisel. The cavity

was cleaned of loose spicula with a pair of dressing forceps, and the bones were sewed together with strong chromic catgut. No irrigation. Pieces of bichloride gauze were used for sponges. The external wound was closed with interrupted catgut sutures; no drainage; a plaster cast over an iodoform gauze dressing completed the operation. There was nothing of interest in the recovery. Three weeks after, the dressing was removed; union had taken place by first intention. A year after the operation the child walked on the sole of his foot, no apparatus having been used at any time.

Case II.—Double congenital talipes varus. Walks on back of feet.—Anthony C., æt. 15 years, born of healthy parents, is the only child of a large family that has any deformity; has always been healthy; has been treated from his youth with club-foot shoes; was tenotomized, but never derived any benefit therefrom. There is a heavy callus covering skin on sides and back of feet.

Operation September 14, 1889. Ether anæsthesia. Foot treated as in Case I. Bone was harder, which necessitated the use of the hammer. Soft parts protected by straightened Parker's retractors. The V-shaped piece of bone removed was larger than in Case I. The bones were united with double strong chromic catgut, and the external incision closed with the same material.

There was slight suppuration in the right foot, but it only necessitated a change of dressing twice. A year afterward one of the finest results one can hope for was found to have been secured. Both feet were operated at the same time.

Case III.—Double congenital talipes varus. Stands on sides of feet.—Elzear P., a healthy boy, æt. 3 years, was kindly sent to me for operation by the Hon. Dr. Fisct, M P., of Rimouski, P. F., Canada.

Operation April 7, 1890. Chloroform and alcohol one-fifth anæsthesia. Same antiseptic precautions as in the other cases. Both feet operated at one sitting; bones soft; same dressings. Dressings removed on 18th day, parents going back home the next day. The father writes in sending photo that the child walks on the soles of his feet, toeing in, like an Indian.

Case IV.—Double congenital talipes varus.—Baby S., æt. 7 months; tenotomised when a few weeks old, without any improvement.

Operation May 31, 1890. Same anæsthetic as Case III; same precautions. Both feet operated upon; bones united with medium-sized catgut; same dressings as in other cases. No disturbance after operation. Dressings removed in three weeks. A recent inspection of the case shows a perfect result.

DISLOCATION OF THE MALAR BONE.

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INJURIES of the malar bone are so rare, probably because of its position and firm attachments, that a pure dislocation has seemed worthy of report.

The patient, two weeks before coming under my observation, received a severe blow from the fist of an antagonist in a brawl. His eye was very much blackened and swollen, but no injury to the bone was at that time discovered. He came to inquire the meaning of a small lump immediately under the center of the orbit. It was about the size of a .22 bullet, and evidently bone. He also complained that movements of the jaws were very painful at the point where the coronoid process passed under the zygoma. A short examination proved that the prominence under the middle of the orbit was the maxillary process of the malar bone, which had been torn from its union with the superior maxilla, and now projected upward and inward. In order to produce this result the blow must have been an "upper cut," coming from the right hand of the other fighter. A slight depression could be felt where the zygomatic process of the malar joins the like named process of the temporal bone. The pain caused by the motion of the jaws is easily accounted for by the fact that the masseter, being in action, must necessarily disturb the dislocated malar bone; and possibly also by the coronoid process of the jaws rubbing against callus or inflammatory material at the union of the two zygomatic processes, since in its relations to the under side of the zygoma the coronoid process lies opposite this line of union.

I could not reduce the dislocation by any reasonable amount of force, and, as the only apparent deformity was the prominence under the eye, I advised that well enough be let alone, promising to cut down upon and shave the projecting maxillary process level with the bone, if the patient wished such an operation for cosmetic effect.

In looking over the literature of the subject I can find no reported case of simple dislocation of the malar bone. Hamilton says he can find no case of simple fracture unconnected with fracture of other facial bones. On dislocation of this bone he says nothing. Packard, in the *Encyclopædia of Surgery*, under the head of fractures of the malar, says they are very rare, and then refers to a case reported by Malgaigne, which, it seems to me, is clearly a case of dislocation. If so, then my claim to have seen no case reported is invalidated. He also says that a few cases are on record in which it has been separated from the adjoining bone by very great force. These cases, though obscurely reported, seem also to be dislocations, though the author is writing under the head of fractures of the malar bone.

However rare this injury may have been, we certainly have in this case an upward, forward and inward dislocation of the malar bone, exactly what might have been expected from the direction and point of application if the blow producing it had force enough to tear away the firm attachments of this bone.

EDITORIAL ARTICLES.

DRAINAGE IN PELVIC-ABDOMINAL SURGERY.

Dr. Hunter Robb, in the Johns Hopkins Hospital Reports, Vol II, Nos. 3 and 4, describes the practice of Dr. H. A. Kelly, Chief of the Gynæcological Department of that hospital, in the matter of drainage after pelvic-abdominal operations. His article is concise, yet so definite and minute in its descriptions of essential details as to make it of special value as a guide to others whose work carries them into this region.

According to the author drainage is to be employed to meet the following conditions:

First, to provide a means of escape for the serous oozing, which follows the separation of broad adherent surfaces.

Second, to guard against septic peritonitis from retained pus from the tube, ovary, or other viscus.

Third, to remove the fluid in cases of persistent capillary hæmorrhage.

Fourth, to provide against secondary hæmorrhage in cases of hysterectomy, where the pedicle is dropped.

Fifth, to drain the peritoneal cavity and starve out the disease in cases of chronic or tuberculous peritonitis.

Koeberlé's glass tubes, with trifling modifications, are still the best. These tubes are straight, of a length varying from 5 to 6 inches, and a diameter of 8, 10 and 12 mm, all lengths being made of these diameters.

Tubes curved at the end are also valuable in cases of oophorectomy for fibro-myoma of the uterus, where it is necessary to drain Douglass' pouch over the convex surface of the tumor.

Every tube should be perforated with 9-12 holes, 1 mm. in diame-

ter, extending from the lower end, one-third the length of the tube. When the diameter of the holes is larger than 1 mm., the omentum and the small intestines are very apt to work into the lumen of the tube, forming a strangulated hernia giving rise to severe pain and vomiting with hæmorrhage and sloughing.

The tube should be so placed that it will drain the fluid accumulating in the most dependent portion of the pelvis. This is best accomplished by inserting the tube in Douglass' cul-de-sac, so that it lies just behind the uterus gently resting on the floor of the pelvis.

The upper portion of the tube rests in the abdominal incision, from an inch and a half to three inches above the symphysis pubis.

Capillary drainage through the glass tube, by wick, gauze or cotton, should be provided for.

One of these substances thoroughly sterilized, and carefully placed in the tube so as to drain from the bottom, will insure a steady capillary flow of fluid from the bottom of the pelvis to the outside.

A drain made of ordinary lamp wick is the most efficient; next to this stands gauze, twisted into rolls just large enough to enter the tube easily.

In some cases of widespread injury to the cellular tissue of the pelvis, it is impossible to check the bleeding, and drain satisfactorily by means of the glass tube alone. Under these circumstances it is often possible to stop the hæmorrhage and drain the pelvis by packing long strips of a 5% iodoform gauze, an inch in width, behind the uterus and laterally, bringing them out at the lower angle of the wound. Firmer pressure can be made, and drainage secured by folding or coiling the gauze as it is placed in the pelvis, in the form of a spring, bringing one end out through a drainage tube.

The pressure on the tube, and through this on the gauze packed in the pelvis, can be regulated by tightening the abdominal binder.

A pack introduced in this way can be removed with very little disturbance by slightly raising the tube and pulling the gauze out through the tube layer by layer.

There is thus no danger of drawing out intestines or omentum with the dressing.

The Care of the Tube.—Let the tube be carefully placed, and the capillary drainage be properly provided for in the manner described, and there will be a continuous flow from the peritoneal cavity to the outside; and the tube will not need cleansing as frequently as has been thought necessary by some.

It is useless to remove the dressings every hour or two, exposing the patient to the risk of a septic infection by repeatedly cleaning out the tube. If the tube is properly arranged it can safely be left to care for itself for a period of from twelve to twenty-four hours, when it becomes necessary to expose it to remove the overlying dressings saturated by the discharge.

In fifty cases thus drained, this point has been tested by allowing the tubes to go without dressing for 24 to 48 hours, and in no case was a single unfavorable symptom observed.

The importance of perfect cleanliness in dressing the tube is not usually sufficiently appreciated. Hands, instruments, and dressings employed must be as thoroughly aseptic as at the time of operation, to avoid the danger of introducing infection from without.

For the purpose of cleaning out the tube, a tube forceps will prove very valuable in facilitating rapid, clean work. Such a forceps, devised by Dr. Kelly, consists of two very slender tapering-handles, crossing like scissors, and terminating below in rat teeth, to hold the little ball of cotton carried down to the bottom of the tube.

The blades are held by a new lock; devised for the purpose, above the forceps.

A piece of sterilized cotton, sponge or gauze, small enough to pass easily down to the bottom of the tube, is grasped in the forceps, and gently guided down into the pelvis, and upon withdrawal brings up the secretions.

This pledget is thrown away, and a fresh one used until the tube is dry.

This is a better method than the use of a suction apparatus, which is not efficient, and is at once contaminated and unfit for further use.

It is necessary at each dressing after cleaning the tube to rotate it, at least three times. It will sometimes be found, especially with per-

forations of larger calibre, that pieces of omentum as large as a split pea have become firmly fixed in the holes in the tube, forming a veritable omental hernia. Sometimes all the holes on one side will thus be choked. If gentle rotation and traction fail to effect a release, the tube must be carefully lifted up far enough to permit of a ligature being passed on the outside of the tube, around each little hernial mass in turn; after tying the ligature the tube should be cut loose by delicate, long bladed scissors, or by a slender knife. If the intestine should be caught in this way, it must be released by traction and careful pressure from the inside of the tube, with a small piece of cotton or gauze, in the grasp of the tube forceps.

In handling the drainage tube, the first principle is asepsis with hands and instruments, and antiseptic dressings immediately in and about the tube.

The following three modes of dressing the tube are described at length, as under each an important series of bacteriological investigations was made relative to the septic or aseptic condition of the tube contents.

The first mode, with bichloride cotton (1-200), dry or moist, and powdered iodoform and boric acid (1-7).

The procedure was to remove all the secretion from the tube with the bichloride cotton, held in the tube forceps, and then to dust from three to five grains of the powder mixture into the tube; then to moisten with distilled water a piece of bichloride cotton a little smaller than the tube, and from an inch to an inch and a half longer; squeezing this fairly dry, and twisting it into a roll, it was carried to the bottom of the tube, either by inserting it like a pencil, or by pushing it with the tube forceps.

The external dressing was completed by taking a piece of the bichloride cotton about seven inches square, and making a hole in the centre of it, this was then laid over the tube and the bichloride cotton was piled up around it and over all until the whole surrounding area was well protected.

The second mode of dressing was with bichloride cotton (1-200), and cheese cloth sterilized and kept in alcohol, in strips from $\frac{3}{4}$ to 1 inch in width and from $5\frac{1}{2}$ to 7 inches in length.

The tube was cleansed as described and dressed with one of these strips taken from the bottle, wrung out in hot, distilled water, and twisted into a long plug, which loosely filled the tube.

In some few cases, dressed in this manner, the powder mixture of iodoform and boric acid (1-7) was used.

Third mode. The dry *bichloride cotton* (1-200) was used alone, both for cleaning and plugging the tube.

Although the results of the bacteriological experiments have been practically the same, according as one or the other manner of dressing was adopted, the most reliance is to be placed on the combination of the first and second methods, *i. e.*, the use of the bichloride cotton and sterilized gauze with powdered iodoform and boric acid, the cotton for cleaning the tube, the powder to dust down the tube, and the gauze for the drain.

No case has ever exhibited either local or systemic toxic effect from the dressing, although it is possible that sufficient of the bichloride escapes from the dressing to inhibit the growth of any micro organisms, which might chance to be present in the neighborhood of the tube.

When and How to Deliver the Drainage Tube.—The decision as to how long the tube shall be left in the abdomen is difficult in some cases. The general rule must be that it is safer to drain too long than for too short a time.

It must be borne in mind that the tube is inserted for the purpose of drainage, and that its function is over, and it should be removed as soon as the flow of fluid is not more than enough to wet the plug in the tube. This point may be reached in from twelve to twenty-four hours or in some instances not until the fourth or fifth day. The early removal of a tube relieves the patient of discomfort and anxiety; it also allows the fresh tissues of the tube track to collapse, promoting immediate union, and diminishing the liability to ventral hernia at a later date.

If there is but a small flow of serum on the dressing about the tube, and the general condition of the patient is good the tube may be removed without fear, and the slight accumulation left to the care of the

peritoneum. If on the other hand the pulse and temperature are of such a character as to occasion any anxiety, the pulse being 120 and the temperature over 100°, although the discharge is slight it is better not to remove the tube and close the wound, until all flow has ceased.

When the tube is removed and there is a slight purulent discharge we may keep the track open by inserting a piece of twisted gauze, which is changed once in twelve or twenty four hours, dusting in a few grains of the iodoform and boric powder at each dressing.

This allows the tube track to close up gradually, carrying off at the same time any noxious fluids which would otherwise tend to accumulate. Where there exists a free purulent discharge from the first the tube should not be removed until one or two weeks have passed, to prevent the formation of pockets of pus in the pelvis, with secondary infection.

Another method of removing the tube where the discharge is rapidly diminishing, and does not amount to more than a few drachms in twenty-four hours, is by rotating and raising it slightly at each dressing. Before final removal, the tube should be cleansed as thoroughly as possible and rotated, to be sure that the intestines are free, and then placing the thumb over the end and grasping the tube between the first and middle fingers, it is slowly and gently removed. As soon as it is out, the wound is dried and the provisional suture drawn up, closing the track of the tube in the abdominal wall. The provisional sutures are one or two sutures passed through both sides of the abdominal incision in the tube track, and left loose until the tube is removed, when they are drawn up, completely closing the wound.

In the opinion of the author the vast majority of abdominal cases are safer with the tube than without it. The bad results attributed to its use are usually due to carelessness of management. The care of the tube is the duty of the surgeon himself, or of some one equally conscientious. and as well instructed.

Report of Culture Experiments Made with the Drainage Tubes.—These experiments were made on thirty cases in three groups, consisting of ten cases in each group.

In the first group, five of the experiments were made by stab cultures in nutrient agar-agar, two tubes being employed for each dressing. In the remaining five cases of this group, six Esmarch tubes were used at each dressing. In making the cultures, three were taken from the secretion on the end of the plug, and three from the bottom of the drainage tube. The second and third tubes were dilutions from the original inoculations in the first tube.

The results were negative, save in one case, that of a large ovarian cystoma, which was firmly adherent to the anterior abdominal wall. The inoculations made from the secretions on the end of the drainage tube resulted in an abundant growth of *staphylococcus pyogenes aureus*. Microscopic examination of the secretions themselves revealed the presence of the ordinary pus cells. The subsequent dressings in this case gave negative results.

In the second group of inoculations, the materials used were the same as those in the second method of dressing the tube, as above described.

Esmarch tubes were used throughout this series, six for each dressing, three being taken from the secretion on the end of the plug, and three from the secretion in the bottom of the drainage tube, after removing the plug. Six of this group were controlled by microscopic examinations. The results were all negative.

In the third group, the materials were the same as those employed with the third method of dressing the tube. None of the experiments in this series were controlled by microscopic examination. The results were also negative.

From these results one might reasonably suppose that organisms were not present in the fluid. One point, however, must be borne in mind, that is the possibility of a certain amount of bichloride of mercury being dissolved out of the plug, and present, as such, in the secretions, from which the inoculations were made. In this case it is easy to see that the growth of organisms, which might have been present, would be inhibited by the bichloride taken up on the needle used in inoculating the tubes. As has been shown by recent experiments, the amount of bichloride necessary to prevent the growth of organisms

which have already been exposed to its action is very much smaller than the amount necessary to inhibit the growth of the same organisms which have not been so exposed.

Only a small proportion of these culture experiments were controlled by a microscopic examination of the fluid. The results in those cases, in which it was resorted to, however, corresponded to those obtained in the culture tubes.

A similar line of experiment, according to the improved methods recently developed for the study of organisms which have been subjected to the action of antiseptics, more particularly the bichloride of mercury, has been begun; and the results will be reported in a coming fasciculus.

THE ESSENTIALS OF A GOOD OPERATING ROOM.

Dr Lucas-Championniere, of the Hospital Saint Louis, of Paris, gives in the *Revue d'Hygiene*, of April, 1890, his views of the conditions which are essential to provide a proper operating room, where the requirements of antiseptic surgery may be thoroughly met.

As testimony that he can speak with authority on the subject, he points to his own record, achieved, apparently, in the most unfavorable surroundings—132 abdominal sections, with but 10 deaths, 237 other major operations, with no deaths. His work is carried on without suppuration. From his own experience—and he challenges any one to show a better record—he concludes that complicated paraphernalia and expensive equipments are not necessary for the doing of good work. What should be studied by the surgeon in planning his operative surroundings is simplicity of arrangement, such convenience of equipment that work shall be readily done and perfect supervision always possible. The ability to constantly watch and verify every operative step, he believes to have been the secret of his own success, handicapped, as he has been, by unfavorable surroundings. With this preface, the author passes to consider some

Antiseptic illusions. Under this head, he criticizes, first, those

forms of apparatus for sterilizing water by boiling, which he has seen in various newly and expensively equipped operating theatres. Many surgeons think that boiling is not enough, but that the temperature should be carried up to 250° F. But in general an apparatus is provided which is self feeding; that is to say, every time water is drawn from it which has really boiled, there enters it water which has not boiled at all, and from that moment, if they do not wait for quite a time, the water contained in the apparatus is not sterilized at all. The only apparatus, then, which can be depended on for sure sterilization is a good kettle, which can be filled up only when its sterilized contents have been used out.

The efforts of certain surgeons to furnish for the operating room air which has been previously sterilized, are also characterized by the author as illusory. The dangers due to the entering volumes of air are absolutely insignificant compared to the dangers due to the presence in the room of living beings, assistants and spectators, who are continually projecting into the room a considerable number of microbes. If we cannot avoid the latter source of infection, it is useless to try to keep off the former, which are so insignificant. To be logical in this respect, surgeons must operate in solitude. Such a precaution, however, the author spurns as an avowal of powerlessness that he is unwilling to make. Good antiseptic surgery, he says, can be done everywhere, and in public.

In all modern operating rooms an elaborate system of drains is seen, both for the table and the floor. This system of drainage is very difficult to manage, and, in the opinion of the author, is of no value to those who know how to do antiseptic surgery. It has come into use from the practice of copious irrigations of wounds, a practice against which Championniere protests as irrational, and dangerous to the patients.

Against another dominating peculiarity of modern operating rooms he also inveighs, that is the covering the walls with glass under the pretext of providing a smooth non-absorbable surface. Such rooms, equipped at great expense, are often badly kept in order.

From these criticisms the author passes to a statement of the things which, in his view, are essential to the practice of good surgery.

The first prerequisite for an operating room is that it should be conveniently placed for the accommodation of the service. It should be as near as possible to the wards, and easily accessible from them. It is not a matter of indifference to patients, upon whom major operations have been done, if they have to be carried long distances afterward.

For the same reason the room should be on the same level with the wards. (This reason does not hold in hospitals, in which elevators practically make all floors on the same level. ED.) Then the transportation of patients is greatly facilitated; transfers, often hurtful, are avoided, and such a simplicity of apparatus can be maintained that there is but little chance of its getting out of order.

There is no advantage in having several operating rooms, one for women, another for men. The operative requirements for the two sexes are the same. The single operating room should be used for everything, and by strict surveillance should be kept in perfect order.

Although the room, if it is to accommodate many spectators, should be quite large, it ought not to be made unnecessarily large. The ability to heat it sufficiently must be kept in mind. It must, however, be large enough to permit the operating table to be moved about in every direction, besides giving room for other necessary furniture.

A steady, not brilliant, light is desirable. A north light is the most convenient. A western light is not bad for those who operate in the morning. Direct sunlight is objectionable. Electric lamps are desirable for night work, or when the daylight is not sufficient, and especially when a deep cavity is to be illuminated. The lighting of the room should be complete; there should be no dark corners.

The general arrangement of the room should be such as to make its cleansing easy and absolute. The effacing of all angles is useful, but not indispensable. The walls may be of various materials; were it not for its costliness, enamelled tiles would be preferred. But common plaster, painted, does well. Painted wood is easy to clean and is economical; it stands well the application of antiseptics; it is easier to repair than plaster, so that accidents to it do not cause so much anxiety.

For these reasons the author has chosen wooden walls for his operating room. As to the floor, though mosaic is pretty and easily washed, it, together with asphalt and tiling, requires copious washings, which have their inconveniences. The author thinks that an equally good result can be had with simpler means. A simple floor of fir wood is doubtless much less agreeable to the eye than the floorings that have been mentioned, but it answers all the requirements of the work; it is very cheap, and if it becomes worn, it is easily replaced. It is much more agreeable to the feet than mosaic or asphalt; however, it is quite as easy to keep clean. The cleansing can be done with less water. Its purification can always be assured by applying to it a 5% solution of chloride of zinc, a procedure constantly employed by the author at the Hospital Saint Louis, where the floor, of fir, already old and poorly cared for during years, presents especially bad conditions. Here he has prosecuted his work successfully, notwithstanding the want of conveniences has often compelled the operating room to be devoted to uses that should always be proscribed, and although the floor has been often inundated with infective material.

The general arrangement of the room should be such that there could be no possible current of air over the operating table; it is desirable, also, that the opening of the door may not chill the room. The operating room ought not to open upon a cold corridor; it ought to be possible for patients to be returned to the wards without exposing them to chilling.

The warming of the room is an important point. For this purpose the author prefers the porcelain stove, which is peculiar to France and Germany. While it does not contribute to ventilation, neither does it produce currents of air. Ventilation can be secured by opening the windows. He has also in his operating room a large porcelain enclosed heating oven for linen, which he values highly. It is heated by gas, and is surrounded by an air chamber so that the linen may not be burned.

The instruments should be kept in a case in the room. He cannot comprehend how, under pretext of promoting the purity of the room, they should be kept out. To remove them complicates the preparations

for an operation, and makes difficult the desired surveillance over them. Also there should be kept in the room everything necessary for dressings. Championniere keeps them in metal boxes, or in glass jars placed simply on wooden slabs, covered with oil cloth, which are easily cleaned.

For washing purposes all the complicated appliances of the plumber's art are rejected, and simple basins, to be emptied into a well trapped sink, chosen. The sink should have its surfaces perfectly smooth, and should be made of porcelain, or similar substance. The same sink can be used for the reception of all fluid which is to be emptied. Two or three basins placed on a wooden table, covered with oil-cloth, constitute a sufficient apparatus.

The operating table should be simple, cheap, easy to clean, easy to replace. The patient, when upon it, ought to be comfortable, warm, and easily removed. The author has a wheeled table which serves both for an operating table, and for the transportation of the patient. It is of wood, with two large wheels at one end, while the legs at the other end rest solidly on the floor. To mobilize it, a simple mechanism causes to project a third wheel which can be moved in any direction. A hair mattress covers the table. The patient, placed on the table in the ward, is easily brought by a single man into the operating room. Here he is practically on an ordinary bed, except that he is more elevated. Hot blankets and sheets are freely used to create favorable surroundings for operating. This table is used for all operations, even laparotomies. All complicated mechanisms for elevating the table have been abandoned. No copious irrigations are used. The small quantity of liquid really required can be removed with a sponge.

For holding the instruments, a metallic table is used, into which are fitted four movable metal basins. These contain the solutions into which the instruments are plunged, and remain convenient to the surgeon's hand. It is moved about easily, and no second person to hand the instruments is required. Another and deeper basin, also supported on a framework, is used for holding a stronger antiseptic solution, in which the instruments are immersed for a time before being placed in

the basins for the use of the surgeon. Upon a small table, covered with oil cloth, are placed two basins for the sponges. Upon another table is the spray apparatus. Around the room are two large wooden tables, covered with oil-cloth, for miscellaneous use. In addition to these things, the room contains a boiler for boiling water.

An indispensable annex to an operating room is a room for administering anæsthetics.

The author concludes by expressing the opinion that instead of lavishing so much money for constructions that will soon be out of fashion, it would be much better to use this money for improving the service, by employing more intelligent, diligent and accurate assistants, a progress in the service of an operating room that no architect could supply. He claims that the extraordinary luxurious and complicated arrangements, which are now so much in vogue, do not conform either to the theory or practice of antisepsis. They are useless and dangerous, and tend to produce a bad effect on medical pupils, who quickly imagine that surgery consists in this complex and mysterious apparatus. They become discouraged from so difficult a work, and attribute to their lack of resources the results of their ignorance. The luxury of the instructors entails either discouragement or undue assurance in the pupils.

L. S. PILCHER.

INDEX OF SURGICAL PROGRESS.

HEAD AND NECK.

I. **Empyema of the Frontal Sinus.** By OSCAR BLOCH (Copenhagen.) The writer relates the case of a child, æt. 13 years, who suffered from empyema of the frontal sinus to such an extent that the globe of the eye deviated from the normal position and was hindered in its movements. The disease had made its appearance ten years ago, after an attack of morbilli. At the operation a cavity extending clear back to the bottom of the orbit was found; communicating with the frontal sinus, which was not much dilated. The contents were green, mucous, odorless, half dried pus, which was found to be free from microbes. The wound was dressed with iodoform gauze. Recovery took place uneventfully.—*Nordiskt. Medicinskt. Arkiv.*, bd. 21, hft. 2.

II. **A Case of Rhinolith.** By G. BADEN (Odeuse.) The writer communicates the case of a widow, æt. 45 years, who, for about four years, had suffered from a badly smelling discharge from the right nostril. There were no pains in the beginning, but during the last two and a half years there were pains which radiated up towards the right side of the head. Upon examination the right side of the nose was found filled up with fetid pus, and about three quarters of an inch back of the aperture of the nostril a hard stone with jagged corners was discovered, which was removed, after crushing, by the forceps. The rhinolith revealed itself to be of a stony consistence and deposited stratiformly around a cherry pit in its centre.—*Hospitals-Tidende*, R. 3, bd. 7, pp. 157, 227.

III. **Primary Carcinoma of the Right Tonsil; Sudden Death.** By M. SCHMIDT. A man, æt. 72 years, presented a tumor

of the tonsil of the size of a pigeon's egg. The tumor, which was of fungous consistency, was the source of persistent pains and the patient was emaciated and in a state of advanced cachexia. After some time there were symptoms of compression and especially of the cervical vasculo-nervous fascia. He also suffered from vertigo and a tendency to somnolence. One night the patient died suddenly. There was no blood in the pharynx, and death must be attributed to some bulbar accident — *Gazette des Hopitaux*, March 29, 1890.

F. H. PRITCHARD (Boston).

IV. Conjunctivoplastics in Chronic Trachoma. By DR KASIMIR NOISZEWSKI (Duenaburg, Russia). The author communicates eight cases of severe chronic trachoma, which he treated after a novel method, consisting in scraping out all degenerated tissue down to the inner surface of the palpebral cartilage and transplanting to the raw surface a corresponding piece of the patient's labial mucous membrane. Of the 8 cases, 7 were those of indurated trachoma complicated in 3 with pannus carnosus and in 2 with infiltration of the cornea; the 8th patient had soft trachoma with corneal opacity and pannus. The author deduces the following corollaries from his operations: 1. Conjunctivoplastics is indicated in cases of indurated trachoma complicated with pannus carnosus and accompanied by vision $= \frac{1}{100}$. In such cases the operation is rapidly followed by excellent results amounting to a radical cure. 2. The transplantation leads to the disappearance of trachoma in the conjunctiva adjacent to the graft, the process of clearing being accompanied by a viscid mucoid secretion which is sometimes fairly profuse. 3. The changes which are to be observed in the labial graft may be divided into three distinct periods: *a*, the stage of maceration, lasting from 5 to 7 days; *b*, that of vascularization which lasts for 3 or 4 months or even longer, the graft looking swollen or fleshy and easily bleeding on slightest traumatic provocation. In the presence of a very intense congestion of the transplanted tissue, occasional slight scarifications may prove useful during the period; *c*, the stage of partial obliteration of the blood-vessels. 4. The operation is contra-indicated, or, at least, not indicated in such

cases where the ordinary treatment may yet prove successful—especially where the cornea remained sound, transparent and normally sensitive. In such patients, the transplantation gives rise to a permanent uncomfortable sensation of a foreign body (“cotton-wool”) in the eye operated upon. [A detailed account of the author’s first case may be found in the *Gazeta Lekarska*, No. 50, 1889; a paper on the first four cases in the *Centblt. f. Praktische Augenheilkunde*, February, 1890.]—*Wratch*, No. 29, 1890, p. 643.

VALERIUS IDELSON (Berne.)

IV. Two Cases of Laryngectomy. By MR. D. WALLACE (Edinburgh.) The author reports two recent cases of laryngectomy done by Prof. J. Chiene, of Edinburgh, both for the removal of epithelioma. In the first case, a female, *æt.* 32 years, the disease began in the *œsophagus*, necessitating an *œsophagostomy* two months before the final operation. The progressive involvement of the larynx in the disease finally made tracheotomy necessary, but patient refused to have anything done unless the whole disease was removed. This was accordingly done. The whole larynx and the upper part of the *œsophagus* were removed. Death by septic pneumonia on the twelfth day.

The second case was in a man, *æt.* 44 years. Preliminary tracheotomy had been done two weeks before the final operation. The patient was anæsthetized by chloroform through the tracheotomy tube. The patient was placed with his shoulders raised and head hanging over the end of the table. An incision was made in the middle line of the neck from the hyoid bone to the level of the cricoid cartilage. The sterno thyroid and thyro-hyoid muscles were separated from the right ala of the thyroid cartilage, and turned back along with the skin and fascia covering them. The edges of the wound were held apart by two retractors, kept in position by an elastic bandage passed round the neck posteriorly. All bleeding having been arrested, the thyroid cartilage was divided up the middle line with a knife. The two alæ were held apart, the interior of the larynx being thus thoroughly exposed to view. It was now seen that the tumor was growing chiefly

from the inner aspect of the right ala of thyroid, from which it projected across the box of the larynx for nearly three-quarters of an inch. The tumor was also attached to the true vocal cords, the right being replaced by it. A small sponge was introduced into the lower part of the wound, so as completely to plug the trachea above the tracheotomy tube; and the right ala of thyroid with the attached tumor was removed by strong scissors. The other portions of the tumor were removed piece by piece, until a thorough removal of all the affected tissue had been effected. This necessitated the removal of nearly the whole of the left ala of the thyroid. Some cedematous mucous membrane at the upper part of the larynx simulated in appearance rather closely the new growth, and this in great part was removed. After careful examination this was believed to be merely cedematous mucous membrane, and the other portions of it were therefore not removed. There was very little bleeding during the operation, and any that occurred was readily arrested by forcip-pressure and torsion. Some iodoform powder was dusted over the wound. A plug of aseptic gauze was inserted so as to close especially the upper tracheal opening, but otherwise the wound was left quite freely open. The operation from beginning to end lasted rather more than one hour.

The after progress of the case was favorable and simple. The feeding through the œsophagus tube was well borne. As the wound contracted, he was not able to tolerate any tube passing upward into the mouth. But, though this portion of the wound became greatly contracted, he still can speak in a hoarse whisper.—*Edinburg Med. Jour.*, October, 1890

GENITO-URINARY ORGANS.

I. Extirpation of a Calculus From the Ureter by the Combined Abdominal Lumbar Section. By R. B. HALL, M. D., Cincinnati Female, æt. 36 years. Subject to sudden and severe paroxysms of pain, beginning in region of left kidney and later in each attack becoming diffused over whole abdomen, every three to six weeks during a period of three years. Paroxysm lasted from 3 to 6 hours; each paroxysm preceded by uneasy sensations for some hours. In

each paroxysm the pain would suddenly disappear. No hæmaturia or other sign of kidney disease. Palpation of abdomen negative. Patient anæsthetized for explorative laparotomy as an attack was coming on. Palpation then revealed presence of a small tumor in region of left kidney. On introducing hand into abdominal cavity an elongated thin walled cyst, just below the kidney, was felt, and at the lowest point of this a calculus could be felt. Diagnosis of a stone impacted in the ureter was made, and a lumbar incision was at once made for its removal. After cutting down to the kidney it was fixed with the left hand and incised, making an incision large enough to admit the finger. At once there was a gush of about one pint of urine. The cyst in the abdomen had now disappeared, leaving the kidney in its normal position. The stone could be felt about $2\frac{1}{2}$ inches below the pelvis of the kidney, in place of $3\frac{1}{2}$, as it appeared before the kidney was incised. The removal of the stone proved to be an exceedingly difficult task. With a pair of forceps introduced through the lumbar incision, guided and aided by the hand inside of the abdominal cavity, several attempts were made to dislodge and remove the stone. It could not be grasped in the bite of the forceps without at the same time including the surrounding tissues, as could be very easily determined by the hand inside of the abdomen. Finding that it was impossible to remove the stone through the lumbar incision without more room, the kidney was laid freely open along the convex border, leaving about half an inch of kidney tissue at either end of the organ unincised, with the intention of first removing the stone, and later the kidney if the hæmorrhage could not be controlled. The kidney wound was held aside by retractors in the hands of the assistants, and after a tedious effort by invaginating the sac with the hand inside the abdomen, the stone was reached with the handle of the scalpel and peeled from the tissues about it. The hæmorrhage from the kidney was controlled by sponges from hot water. The wound in the loin was dressed by placing a rubber drainage-tube in the kidney. This tube was long enough to reach over the side of the bed to a bottle upon the floor, where the urine was collected from the kidney. The wound was sutured carefully around the drainage-tube. A glass drainage-tube was placed in the abdominal cavity,

which was removed in eighteen hours, as it was not required. Patient suffered very greatly from shock, attributable, partly, to the loss of blood. Highest pulse after she rallied was 126, and highest temperature 100.8° F., for one registration only, which was on the following day at 3 P.M. After that time the temperature varied from 98.5° F., to 99.5° F. After an examination of the stone, which weighed only $3\frac{7}{20}$ grains and measured $\frac{6}{16}$ inch long, $\frac{5}{16}$ inch wide, and $\frac{4}{16}$ inch thick, it was found to have a most peculiar shape. One end was presenting toward the dilated portion of the ureter and kidney where it was impacted with the narrow slot spoken of extending parallel with the ureter, making an opening about the size of the thickness of an ordinary pin, which was quite sufficient to carry off all of the urine from the kidney so long as no mucus or other solid material interfered with this small opening.

The stitches were removed from the abdominal wound on the seventh day. The wound was healed perfectly. On the following day the stitches were removed from the lumbar wound. For eight days the urine passed from the bladder contained small blood-clots, while that from the incised kidney remained clear.

On the eighth day the drainage tube was removed from the kidney wound. For four days after that it appeared as though all of the urine from the left kidney passed through the sinus. After the twelfth day only a small quantity escaped occasionally. This gradually diminished until the sixteenth day, and on the twenty-first day the wound was perfectly healed. On the thirty-sixth day she went home in perfect health.

The author cannot find any previous case of removal of a calculus from the ureter by the combined abdominal-lumbar operation, and but four cases of removal of a stone from the ureter by any other procedure. He refers to the report of a case by Dr. Cullingworth in the "Transactions" of the Pathological Society of London, 1884 and 1885, vol. xxxvi, p. 278, of abdominal section and removal of stone from the ureter near the bladder; patient died fourth day. Dr. Terrey's case in which he was able to remove a stone from the ureter near the kidney by the lumbar incision only; patient recovered. The case is recorded

in the *American Journal of the Medical Sciences*, vol. 97, page 579. A case by Dr. Berg, in *Centrbl. f. Gyn.*, January 28, 1890. A female, sick fifteen years, who had passed about twenty small calculi. Temporary relief followed, and then very severe dysuria set in. By aid of the sound, stone in the bladder was detected. The urethra was dilated, the finger introduced, and it was found that a calculus was impacted in the right ureter, the point projecting into the bladder; the bladder was opened from the vagina and the stone extracted without difficulty. And a case by Dr. A. T. Cabot, reported in the *Boston Med. and Surg. Jour.*, September 11, 1890, in which he removed a stone from the ureter, two inches below the kidney, by the lumbar section only.

(The author has overlooked the case reported by Mr. Twynam, of Sydney, in the *Lancet* of February 1, 1890, in which an explorative laparotomy revealed a calculus in the ureter, which was removed three weeks later through an incision in the groin, as if for the ligation of the common iliac artery. See ANNALS, July, 1890, p. 74. ED.)

—*Medical Record*, October 18, 1890.

II. Report of 18 Cases of Suprapubic Lithotomy, With Immediate Suture of the Bladder in 10; Drainage in 8, and with Prostatectomy in 4. By A. W. MAYO ROBSON, F.R.C.S. (Leeds.) The author advocates suprapubic cystotomy for the removal of all vesical calculi that are judged to be unsuitable for lithotripsy, for these reasons:

a. The operation can be carried out with scientific accuracy and certainty; the anatomical relations of the parts varying so little that with ordinary care there is no danger of making a mistake.

b. It can be performed with safety by surgeons who have only occasionally to perform lithotomy.

c. It is the only operation universally applicable to every size of stone.

d. It can be performed antiseptically, and the parts can be kept aseptic.

e. In old subjects, the interior of the bladder can be thoroughly explored, and if necessary an enlarged middle lobe of the prostate can be removed at the same time.

f. In a sacculated bladder, it is the only method by which the bladder can with certainty be cleared.

g. In a healthy bladder, the vesical wound can be closed with certainty and safety, and where the bladder is not healthy, or where for some reason or other it is not thought desirable to close it at once, drainage can be employed.

The only disadvantages—its taking rather longer and giving a little more trouble—are not of much moment in these days, when anæsthetics and detail in surgery are the rule.

As to the details of the operation, Robson, if there be cystitis, washes out the bladder with a warm solution of boracic acid ($\frac{1}{2}$ ounce to a pint) before beginning the operation. After drawing off the urine, the catheter is retained until the rectal bag is introduced and distended, as otherwise it may be difficult to insert a catheter after the rectal bag is full.

In distending the rectal bag, which is introduced by someone not otherwise helping in the operation, he usually injects about 3 ounces of water in young children, and 8 to 10 ounces in adults, using less at times, but very seldom exceeding that amount, thus avoiding the dangers of over-distension; moreover, as pointed out by Dr. Garson, to inject a large amount into the rectum defeats the object for which it is introduced, namely, the making prominent the bladder. As regards distending the bladder, he is content when he can feel the rounded outline of the bladder between the pubes and the umbilicus; usually about 5 ounces in children, and 10 to 15 ounces in adults is required. Boracic solution is invariably used. After the bladder is distended the catheter is withdrawn and a piece of tape tied round the penis to prevent the fluid returning.

With regard to suturing the bladder, his first case, which was operated on in 1886, was up and well at the end of the week, the catheter never being employed after the operation.

Ten of the series were treated by immediate suture of the bladder; and out of this number in only one did the suture give way. In this case the bladder was so deep as to be almost out of reach of the finger, and the wound was closed imperfectly, but the drainage tube, placed

between the edges of the linea alba, effectually prevented extravasation. This case was the only one in which the catheter was employed after suturing the bladder.

The sutures employed were No. 00 chromicised catgut, which were passed through the outer coats of the bladder, avoiding the mucous membrane. The continuous suture was not employed. It simplifies the manipulations if a temporary suture be passed through the outer tissues of the bladder on each side of the intended incision before it is opened; the edges of the wound in the empty bladder can then be brought up close to the external wound. The patient is encouraged to pass his urine afterwards unaided by the catheter, and, as a rule, there is no difficulty.

As a rule, it is a wise precaution to introduce a small tube superficially. Immediate suture of the bladder is especially applicable, and is very easy in young adults and children, and in thin persons generally. Where there is an accumulation of fat in the abdominal walls it is feasible but more difficult to accomplish, since the bladder is a long way from the surface.

The bladder should not be sutured in cases of cystitis or where the edges of the vesical wound are bruised, as in the extraction of a very large stone or in the manipulations necessary for the removal of an enlarged prostate. After draining the bladder, it hastens recovery and promotes the healing of the wound to allow the patient to get out of bed as early as is consistent with his general condition—often at the end of the first or in the second week—and then the edges of the abdominal wound can be drawn together with strapping.

The following is a synopsis of the cases in which prostatectomy as well as suprapubic lithotomy was performed:

1. B. H., æt. 67 years. History of stone for four years. Urine normal. December 15, 1887, suprapubic lithotomy performed; 12 ounces of water in rectum; 10 ounces of boracic solution in bladder. Lithic acid stone removed weighing 322 grains, and measuring 2 inches in length. Middle lobe of prostate removed; drainage tube inserted December 21. Tube removed December 24; urine passed by urethra.

January 31, made out-patient. Patient at present time in good health and working at his old occupation.

2. J. B., æt. 63 years: admitted June 6. Symptoms of stone for eight years. Sixty-five ounces of alkaline urine removed. June 6. Suprapubic lithotomy performed; 10 ounces of water in the rectum; 12 ounces of boracic solution in the bladder. Fifty calculi removed, largest $1\frac{1}{4}$ inches long. Two masses of adenoid tissue removed from either side of urethral orifice. Drainage tube inserted June 9; tube removed August 3. Patient discharged cured, and is at present time quite well.

3. C. E., æt. 62 years. Symptoms for several years. September, 1888. Middle lobe of prostate and three facettèd calculi, about the size of large filberts, removed. Bladder drained. Patient now in perfect health, and performing his duties as a working man.

4. J. W., æt. 66 years. Four years' history; catheter life greater part of time. Negatively sounded for stone on several occasions by experienced surgeons. March 22, 1890. Suprapubic cystotomy performed; 6 ounces water in rectal bag, and 12 ounces boracic solution in bladder; three stones removed from pouch behind prostate, one the size of a pigeon's egg, two the size of sparrows' eggs; middle lobe of prostate also removed; bladder drained; tube removed on fourth day, Patient up in second week; wound healed within month, and urine passed naturally. Some cystitis still persisted in July, but otherwise the patient was well.—*British Medical Journal*, Oct. 11, 1890.

BONES, JOINTS, ORTHOPÆDIC.

I. Operation for Spina Bifida. By DR. BORELIUS. The writer communicates a case of spina bifida, operated on with success and as the number of cases, which have been cured by operation is, in Scandinavia, especially small, it deserves mention.

The patient was a child, æt. 10 months, well developed physically as well as mentally: there was no hydrocephalus, complete anæsthesia of both legs was present; the left leg was flabby and paralytic and at the same time the child suffered from incontinence of urine and fæces. The tumor was of the size of a goose-egg and situated in the lumbo-sacral

region; it was covered, except two or three centimetres up from the base, with abnormally thickened and hairy skin, its top on the contrary with a bluish red membranous and translucent integument. The tumor was hard, tense and elastic; no nerve-tissue could be seen through its covering.

The child was chloroformed and two cutaneous flaps were dissected off upon both sides, down to the base of the tumor, which could be done without opening the sac. This was then evacuated by slow aspiration and opened by a little incision upon the summit. No nerve-elements were to be seen. The defect in the spinal column was of the size of a cent-piece, the tumor being therefore a pure meningocele. The meningocele-sac was dissected down to the opening in the spinal column and the greatest portion extirpated; the remainder was carefully sutured with silk and the skin-flaps united by a continuous suture. Healing did not take place completely by first intention as for a short time there was some suppuration, but otherwise the course was uneventful. A definite result, however, could not be obtained as the child, later on, was attacked by measles and died.

The usual course of a spina bifida, left to itself, is that the tumor grows little by little, the tension increases and finally it bursts, either spontaneously or from traumatism. The child then, as a rule, dies immediately in general convulsions in consequence of the rupture. If the child survives secondary suppuration attacks the sac, with infectious meningitis or myelitis as a cause of death. Such children rarely survive the first year of their life for spontaneous healing after rupture is one of the rarest terminations. The writer observes that he has only found one such case in the literature and observed a second at Thiersch's clinic, in Leipsic.

[1. Dr. Veron reports in the *Archiv. General. de Med.*, May, 1883, a case where spontaneous opening of the sac, followed by recovery, took place. The patient was a child, æt. 10 years, with a sacral tumor of the size of an apple. The tumor increased in size, the skin mortified, the meningocele opened and cerebro spinal fluid escaped. The child was kept twenty days in the ventral position, the tumor gradually de-

creased to the size of a nut and finally, after a few months, it, upon employment of pressure, disappeared entirely and the opening into the spinal column closed entirely.

2. Mr. Clutton reported in the *London Lancet*, January 16, 1886, p. 108, a case of spontaneous recovery from a large cervical spina bifida.

3. R. A. D. Lithgow communicates in the *Brit. Med. Jour.*, February 11, 1882, a case of spontaneous cure of a lumbar spina bifida.—REPORTER.]—*Hospitals-Tidende*, R. vii, No. 47.

F. H. PRITCHARD (Boston).

II. On Changes in the Epiphyseal Cartilage After Exarticulation. By Dr. MIKHAIL I. DRUJININ (Moscow, Russia). To study the subject the author has carried out a series of experiments on dogs in Prof. N. P. Ivanovsky's laboratory (St. Petersburg). The experiments consisted in amputation of the leg through the knee joint under strictest antiseptic precautions. In from 7 days to 6 months after the operation the animals were killed, and the joint examined both macroscopically and microscopically. The principal outcome of the research may be given as follows: 1. After exarticulation performed under all antiseptic precautions, the epiphyseal cartilage undergoes ossification, which proceeds in a normal or physiological way. 2. In such cases where the synovial membrane has been stripped off, the ossification begins within first few days after the operation. 3. The first stage of the process consists in vascularization, the new blood-vessels starting from the adjacent bone and gradually advancing toward the free surface of the cartilage to pierce the latter through and through. 4. The first phenomena of ossification made their appearance about the walls of cavities containing the new vascular plexus. 5. Very soon after exarticulation, cartilage corpuscles undergo proliferation and lose their physiological grouping in regular rows. In later stages, they form small islets scattered here and there at a long distance one from another. 6. From the beginning to the end, the interstitial substance of the cartilage retains its hyaline character and, generally, does not show any alterations whatever (neither splitting into fibres nor trans-

formation into a fibroid cartilage is ever observed). 7. For a long time the free surface of the cartilage remains smooth and even, while later on it becomes firmly adherent to a newly formed connective tissue. 8. The latter subsequently transforms into a dense periosteal connection tissue. It is a product of a progressive development of granulative tissue which appears shortly after the operation to form a lining for the articular cartilage. 9. The adjacent old epiphyseal bone with time becomes softer and more porous. 10. The newly formed bone is dense and has a perfectly normal appearance. 11. Such portions of the epiphyseal cartilage as have retained their synovial lining do not show any macroscopical deviations from the normal. 12. When examined microscopically, such cartilage proves to present but quite trifling alterations. In fact, the changes, found therein 6 months after exarticulation, resembles those that are detected in a bare cartilage within few days after the operation.—*St. Petersburg Inaugural Dissertation*, 1889, No. 6, pp. 69, with 8 figs.

VALERIUS IDELSON (Berne).

III. The Treatment of Tubercular Joint Disease with Iodoform Injections. By Dr. KRAUSE (Halle). Author has treated severe forms of tubercular joint disease with a 10% solution of iodoform in glycerine, or a 10% watery suspension. Of 60 cases of disease of various joints 23 were cured permanently. Improvement resulted in the majority of cases. In isolated cases arthrectomy or amputation had to be resorted to later. The best results by far were attained in the knee and wrist joints. In aged persons severe tuberculosis of the wrist joint otherwise necessitating amputation made astonishing improvement with the treatment, even when lung phthisis was progressing. In the knee joint cure resulted in some cases with mobility of the knee joint, even in patients beyond 40 years of age. In the hip joint recovery resulted in most cases with ankylosis, though in one or two exceptional cases the mobility of the joint was retained. The cures of the hip joint include some of the most severe forms of coxitis with luxations. v. Volkmann was of the opinion that in the poorer classes in whom it is impracticable to carry out an extended

after-treatment, ankylosis with a certain degree of abduction was desirable. The treatment of the iodoform injections is easily carried out, for it is only necessary for the patient to remain in observation a few days after injection. After the first injection it is more difficult on account of the resistance to make subsequent ones.

There is, evidently, after the first injection cicatrization of the soft parts, with shrinking of the same, tending to cure and diminution in the size of the joint. The pain disappears very rapidly with this treatment, and the general condition of the patient improves. If there be intra- or peri-articular abscesses, the same are evacuated with a large trocar and their cavities irrigated with boracic acid until all clots are washed out; then the iodoform injection is made. Should no abscess exist, then injection is made direct into the joint with a trocar; after this gauze is placed over the perforation made by the trocar, and passive motion employed; this, with massage, distributes the iodoform uniformly throughout the joint. In the wrist joint the trocar is entered at the processus styloidei radii and ulnæ, with the elbow joint at the capitulum radii, with the shoulders external to the coracoides, or at the junction of the acromion with the spine of the scapula. An entrance into the hip joint is best made with a long trocar (7 to 9 cm.) at the great trochanter, the patient lying upon the back. Flexion of the joint is to be avoided. The thigh is best adducted and rotated inward. The trocar is passed in at the superior border of the great trochanter about its mid-point, the instrument is forced inward perpendicularly to the axis of the shaft of the femur until bone is felt; this is the neck of the femur; the limb is now adducted and the trocar passed farther inward until bone is felt a second time; this is the space between the head of the femur and the acetabulum; the needle of the trocar is now withdrawn and the injection made. The knee joint is entered in the usual way. The ankle joint is entered close underneath the malleolar process of tibia or fibula.—*Beilage zur Centr. f. Chir.*, 1890, No. 25.

IV. Fractures of the Leg Produced During Birth. By Dr. BINGNER (Marburg). Author directed attention to a peculiar form

of diaphyseal fracture of the leg produced during birth, and which has hitherto been but little described. These fractures are not only typical in the symptoms they produce, but their peculiarities are explained by the manner in which they originate. They have led to the severest forms of pseudarthrosis, which have resisted all modes of treatment. In the clinic at Halle there have occurred 5 diaphyseal fractures of the leg produced intra-partum. They were mostly produced by forced extraction in delivery. Traction on the feet fractured the tibia and fibula in the inferior half of the diaphysis. Traction being exerted in an exactly opposite direction (antagonistic) to that exerted by the contracting muscle of the calf, an indirect fracture results, a dislocation ad axia, the angle closed anteriorly and open posteriorly. The defective treatment is principally responsible for the subsequent pseudarthroses, and secondly the oblique character and the rebellious angular deformity of the fracture. The latter is perpetuated partly because, at the point of fracture, a piece of bone was sprung out, of wedge-like shape, whose base corresponding to the concavity lay posteriorly, and in part because the quadriceps femoris, acting on the upper fragment, drew this upward, while the lower fragment was drawn posteriorly by the muscle of the calf. The soft parts interposing and the fragments riding past each other also contributed toward producing the pseudarthrosis. The union was compromised in all cases and the fragments were united by fibrous bands or individually cicatrized. At the same time great atrophy of the fractured ends of the fragments resulted. The conical or finely-pointed extremities scarcely touched each other. The atrophy was so great that considerable extent of the continuity of the bone was in time lacking. The bones became so thin and soft through rarefying osteitis that not infrequently they could be cut with knife and scissors. Atrophy of the soft parts through inactivity and considerably retarded development of the extremity completed the characteristic picture of the disease. Naturally, the limb so affected by pseudarthrosis was compromised in its function to an extent as to be entirely useless. Author recommended the following treatment:

1. The hitherto simple transverse osteotomy, or the wedge osteot-

omy, is replaced by an oblique longitudinal osteotomy, an oblique resection of the ends of the fragments. By this means the fragments may be united by surfaces as broad as possible with the least shortening.

2. After suture of the bony fragments to obtain union by granulation rather than primary intention. In this way to call forth marked reaction of the periosteum.

3. To dispense for the same reason with the plaster-of-Paris bandage in these cases. This is replaced by splint which remains day and night on the patient, and which favors the early active exercise of the limb. The most important thing, however, is to recognize these fractures early, and to treat them correctly. They should be treated with splint as soon post-partum as possible. Pseudarthrosis is prevented by exact apposition of fragments, and in order to carry out the above, the occurrence of these fractures should be always kept in mind — *Beilage zur Centr. f. Chir.*, No. 25, 1890.

HENRY KOPLIK (New York).

V. Guermontprez' Method of Reduction of Backward Dislocation of the Femur. By DR. CATOIR (Paris). The method is described as follows: The pelvis is fixed by the left hand of the operator, placed upon the iliac spine, the right hand then grasps the leg, the knee being in a position of extreme flexion, and forcibly flexes the thigh, slightly adducted, until its anterior surface rests upon the abdomen. To and fro movements in the direction of inward and outward rotation are now executed, until the head of the femur rests against the edge of the acetabulum, when direct pressure either by means of the hand of an assistant, or, according to Catoir, the knee of the operator, completes the reduction. During this last portion of the manipulation the extreme flexion of the thigh upon the abdomen should be somewhat relaxed.

The method finds its most practical application in old cases and particularly in those in which the operator is without proper assistance. Guermontprez employed it in an eight weeks' old iliac luxation, under an anæsthetic, having the day previous to the reduction, and without

an anæsthetic, rendered the femur head mobile by means of movements of flexion.—*These de Paris*, 1889.

VI. Ischiatic Arthrotomy and Resection of the Hip-Joint. By DR. A. BIDDER (Germany). In view of the occasional occurrence of instances in which the head and neck of the femur are free from disease, while the acetabulum is the seat of tuberculous and other diseased processes, Bidder proposes, in order to avoid the necessity of sacrificing the former, while the acetabular affection is rendered easily accessible, the following method of procedure:

The patient is placed in a semi-prone position, the hip-joint of the diseased side at an obtuse angle, and the knee-joint of the same limb flexed at a sharp, or at the least, a right angle. Somewhat below the crista-illii, and from 1 to 2 cms. removed from the posterior superior spine the knife is entered and carried in a straight line to the posterior edge of the trochanter major, and somewhat below its base. After incising the gluteus maximus a fascia is found through which may be seen the boundary between the gluteus medius and pyriformis. The tendon of the latter is divided at the lower portion of the wound. By dissection and retraction combined the neck of the femur and edges of the acetabulum are reached by following the edge of the gluteus minimus. In this manner the entire region between the lower edges of the great sciatic notch and the trochanter is cleared. Further above the gluteus medius and pyriformis are detached from each other, the superior gluteal artery and accompanying vein are to be isolated and ligatured, the gluteal nerve, however, being carefully separated and retracted in an upward direction.

The arthrotomy is commenced by an osteo-plastic resection of the trochanter, the latter being separated by a chisel, but allowed to remain attached to the soft parts, the latter being loosened from the digital fossa in such a manner as to permit of the detached bony portion being pushed well forward. If the femur is found to be healthy, but the acetabulum diseased or perforated, the diseased mass is removed as far as possible. An incision in the periosteum is now made along the half moon shaped edge at the site of the great sciatic notch,

loosens the same from the surface of the pelvis, until the acetabulum is reached. Should more room be necessary, the bony edge of the latter is chiselled away. The operation is completed by replacing the head of the femur, and by fixing the detached trochanter, still attached to the soft parts, to the shaft of the femur, and by establishing proper drainage, the tube passing to the acetabulum itself being led out through the sciatic notch.

In case of necessity existing for the removal of the head and neck of the femur, the trochanter should not be spared, inasmuch as it is better to permit the muscular attachments to find their own proper limit of attachment in case of considerable shortening of the column of the thigh.—*Archiv. f. klin. Chir.*, bd. xxxix, p. 742.

GEORGE R. FOWLER (Brooklyn).

VII. On Conservative and Operative Treatment of Tuberculosis of Bones and Joints. By DR. BRONISLAW S.

	Spine	Chest	Shoulder-joint	Humerus	Elbow-joint	Forearm	Hand	Pelvis	Hip-joint	Femur	Knee-joint	Foot	Multiple Lesions	Total
Total number of cases....	34	9	5	4	22	1	11	8	42	7	63	5	48	272
Male.....	21	6	2	4	14	1	7	5	27	5	46	3	32	182
Female ..	13	3	3	..	8	..	4	3	15	2	17	2	16	90
Under 10 years of age....	16	2	1	..	3	..	1	..	17	1	14	..	3	64
From 11 to 20 yrs. of age	7	3	2	2	7	1	2	2	9	3	17	1	14	76
From 21 to 30 " "	7	3	1	2	8	..	5	5	16	1	26	4	17	95
From 31 to 40 " "	3	1	..	..	3	..	1	1	..	2	5	..	8	24
From 41 to 50 " "	1	..	..	..	1	..	2	..	..	..	1	..	3	9
From 51 to 60 " "	..	..	1	..	..	..	..	..	..	..	..	..	1	2
From 61 to 70 " "	..	..	..	..	..	..	..	..	..	..	..	2	..	2
	Body=43 (15.7 per cent.)		Upper limb=43 (15.7 per cent.)					Lower limb=173 (63.9 per cent.)						

KOZŁOWSKI (Kiev, Russia). The author contributes a valuable monograph on this highly important subject, based on 272 cases from Pro-

fessors I. I. Nasiloff's and Bogdanovsky's clinics, in St. Petersburg. The preceding table shows the distribution of the material in regard to the part affected and the patient's sex and age:

Of the 272 cases, 105 (34.9%) were cured; 94 (34.5%) improved; 51 (18.7%) obtained no relief, and 22 (8%) died; therefore a "favorable" issue was observed in 199 (73.5%) cases, an "unfavorable" in 73 (26.8%). Cases of disease of the vertebral column, humerus, forearm, pelvis, femur and leg were treated after conservative methods alone; those of articular affections and of bones of the hand and foot, after both conservative and operative ones. Of 216 conservative cases, 70 (32.1%) were cured; 87 (40.3%) "improved"; 43 (20.1%) obtained no benefit; and 16 (7.3%) died; on the whole, therefore, a "favorable" issue was observed in 158 (72.4%) cases, an "unfavorable" in 59 (27%). Of 56 operative cases, 36 (64.8%) were cured; 6 (11.1%) "improved"; 8 (12.9%) obtained no relief; and 6 (11.1%) died; that is, a "favorable" issue was noticed in 42 (75.9%) cases; an "unfavorable" in 13 (24%). The following table gives the result (in per cent figures) obtained in the group treated after conservative methods alone:

	<i>Favorable Issue.</i>	<i>Unfavorable Issue.</i>
Spine	73.5	26.5
Humerus.....	75	25
Forearm.....	100	.
Pelvis.....	75	25
Femur.....	85.7	14.3
Leg.....	80	20
Multiple Lesions.....	46.6	53.4

The comparative results obtained in the other group where both operative and conservative methods were employed may be seen from his table:

	FAVORABLE ISSUE.		UNFAVORABLE ISSUE.	
	<i>Conservative Cases.</i>	<i>Operative Cases.</i>	<i>Conservative Cases.</i>	<i>Operative Cases.</i>
Chest.	71.5	100	28.5	....
Shoulder-joint	75	100	25	....
Elbow.....	80	85.7	20	14.3
Hand.....	50	66.6	50	33.4
Hip-joint....	71.4	57	28.6	43
Knee-joint...	83.1	60	16.9	40
Foot.....	58.3	83.3	41.7	16.7

The latter figures show, therefore, that in tubercular disease of the hip and knee joints a conservative treatment proves to be more successful than an operative one, while in affections of the elbow joint, hand, and more especially, foot, the reverse is the case. Another more elaborate table (which we omit on account of space) points out that 1, a conservative treatment of affections of the spine, chest, shoulder-joint, humerus, hip- and knee-joints in children is followed by much better results than in adults; 2, but in the case of the elbow-joint and hand, adults obtain more benefit than children; 3, an operative treatment of affections of the elbow, knee and hip-joints in adults proves more beneficial than in children; 4, an operative treatment of the disease of the foot gives equal results in all ages.

The general conclusions drawn by the author from his own clinical researches and the study of international literature (202 works of American, British, Dutch, French, German, Greek, Italian, Polish, Russian and Swedish authors) may be condensed as follows:

1. In children, conservative methods should be preferred to operative ones even in the presence of suppuration and disorganization of the joint. Such treatment gives by far the superior results in regard both to the patient's life and usefulness of the limb.

2. An operative treatment in children may be indicated only in such cases of articular tuberculosis of the upper limb where very considerable suppuration and disorganization of the joint are present. Be

the operation decided upon, all possible attempts at preserving epiphyseal cartilages should be made in order to prevent a consecutive shortening of the limb.

3. In adults, a conservative treatment should be preferred in all cases where no suppuration and disorganization of the joint have yet set in.

4. An operative treatment in adults is indicated only in the presence of suppuration and disorganization of the joint, though even here a conservative method should be preferred as soon as the lesion is limited to some circumscribed foci.

5. As far as adults are concerned, in the case of upper limbs resection is followed by more satisfactory functional results than a conservative treatment, but in the case of the lower limbs conservative methods prove more successful than operative ones.

6. In cases of multiple tubercular lesions of bones and joints, a local treatment alone utterly fails to cure the patient. It can prove beneficial only when combined with an appropriate general treatment.

7. A conservative treatment of osseous and articular tuberculosis deserves most careful attention of the profession. All conservative cases should be published by surgeons as systematically, and described as carefully, as those treated after operative methods.

It will not be superfluous to add that Dr. Kozłowski applies his term "operative methods" solely to amputations, disarticulations, resections, and arthrectomy, while his "conservative methods" include, besides constitutional treatment (climatic, hydrotherapeutic, etc.), a local one by cold, heat (*e. g.*, Professor Nasiloff's scalding-hot compresses,) rubefacients, vesicants, derivants, immobilization, extension, massage, electricity, tapping the joint, intra-articular injections (of iodoform, iodine, tannin, phosphate of calcium, Peruvian balsam, etc.,) arthrotomy with antiseptic irrigations and drainage, and ignipuncture.—*St. Petersburg Inaugural Dissertation*, 1890, No. 57, p. 327.

VALERIUS IDELSON (Berne).

VIII. On Retardation in the Longitudinal Growth of the Radius After Traumatic Separation of the Epiphysis.

By Dr. W. STEHR (Tübingen). In 1881, Bruns, in his work on fractures, presented a collection of 13 cases of consecutive retardation in longitudinal growth after separation of an epiphysis. Since then 8 further cases have been published by observers. Of these 21 cases 10 were of the lower epiphysis of the radius, 6 of the upper humeral, 2 each of the lower ulnar and femoral, and 1 of the lower tibial.

That this retardation by far most frequently follows separation of the lower radial epiphysis is further shown by the 3 cases of this kind since observed in Bruns' clinic, and here considered in detail by Stehr.

In all the 13 cases of this special class, so far as known, the primary accident occurred during the second decennium of life. The shortening appears gradually and produces a typical position of the hand. This becomes more and more flexed radially, and the capitulum ulnæ correspondingly more evident as a roundish prominence. Hence in all there is the same functional disturbance—impeded ulnar flexion, as the ulna, somewhat like an inner splint, limits lateral motion.

The reasons why this retardation is so infrequent in comparison with the frequency of epiphyseal separation, are several. It largely depends on the exact seat of the line of separation. Commonly, even in splintering fractures at this point, the bone-producing cartilage is not sufficiently destroyed to seriously interfere with growth. But in very rare cases the line of division falls in the substance of the intermediary cartilage itself, and then the injury to the cartilage, together with the obstructing and binding new connective tissue, effectually impede the further production of bone. The like may follow in the more common forms of fracture where complications injure or offset the activity of the cartilage.—*Bruns' Beiträge f. klin. Chir.*, Bd. v, heft. iii.

IX. On Traumatic Dislocations of the Hip-Joint. By Dr. F. KNEER. This collection includes all the cases, exclusive of congenital and spontaneous, observed at the Tübingen clinic in 38 years. This accident is infrequent. For though a collection of 1,994 cases of all joints from seven sources gives an average of nearly 10% to the hip, still if fresh dispensary cases only, or even those plus fresh hospital cases, are included, the per cent falls to 2.5½.

After discussing the nearly equal occurrence on the two sides (13 on the right, 17 on the left, 1 double-sided), the much greater frequency in men (26 males to 5 females), and from the 40th to 60th year, he takes up the kind of dislocation. That backward is far more frequent than that forward (26 to 5). Statistics of 210 cases from six sources showed 160 posteriorly to 49 anteriorly. As to which subform of posterior dislocation is the more frequent, the iliac or the sciatic, there is a wide diversity of opinion. Of his cases 22 were iliac and only 5 sciatic, and he selects statistics in the same sense from three other writers, and yet the proportion from 30 autopsies (by Malgaigne, Lossen and himself) is opposed to this view (12 iliac to 18 sciatic).

Of his 5 cases forward, 3 were supra-pubic and 2 infra-pubic (obturator). Statistics of 39 such cases from four sources give 19 supra-pubic and 20 infra-pubic.

Finally, he gives 1 positive case of the very rare supra cotyloid dislocation (he mentions Hamilton's single case, not quite a certain one, amongst 115 cases of hip dislocation). In Kneer's case "the right leg was rotated outward and abducted. On closer examination the head of the femur was found just under the spina anterior superior, and the trochanter somewhat obliquely farther back." He gives one case showing that a supra-cotyloid dislocation may arise from an iliac.

Amongst causes, he mentioned 6 cases that occurred from high falls, 5 from being run over, 5 from heavy blows (*e. g.*, falling timber), 7 from being forcibly thrown to the ground, 7 from being deluged by falling material, and 1 very rare case from slipping up, but before the actual fall (2 other such cases are known, 1 from Mercier, 1 from Malgaigne).

As to the mechanism of the origin of these dislocations, there is great difficulty in getting details from the patient. The posterior dislocation may arise from forced flexion, adduction and rotation inward, or by force striking the thigh when adducted and turned inward, *i. e.*, if the force acts to increase this position. The same explanation holds in the case from slipping. The man was just starting with a load on his back. The left foot slipped backward. This caused a sudden flexion with adduction and rotation in the right hip, and the crack of the dislocation was experienced before he struck the ground.

Dislocation forward arises from immediate extension, abduction and rotation outward

The prognosis largely depends on complications (2 early fatal cases). An illustration shows the posterior appearance in his case of double dislocation backward. "Both trochanters stand out laterally, so that the whole pelvis appears broader; the region of the buttocks is much flattened, the gluteal muscles not forming a prominence as usual." Recently Niehaus has collected 24 cases of double dislocation of the hip, including 4 that were iliac on both sides and 4 that were obturator ditto.

In all his cases that had not existed not longer than one week, reduction was accomplished without great difficulty. But amongst 17 old cases only 7 were successful

As to return of function after reposition, he finds that in two or three weeks, with the help of crutches or sticks, they are able to walk quite well. Later reports from two cases show that these at least regained full use of leg.

Recurrence was not known in any of his cases. He gives 1 case and quotes others to show that old unreduced hip-dislocations, when forward, cause comparatively little inconvenience; exceptionally, also, even in cases backward, fair use of the extremity may be regained.

The method of reduction was the common one, increase of the pathological position followed by the opposite. Of 3 ten weeks old cases, 1 was reduced, whilst 4, from twelve to thirty weeks old, were all unsuccessful. Attempts at reduction in one old case produced a fracture of the femur below the tip of the trochanter, but as this allowed a correct position of the leg, it proved fortunate. In another old case an obturator dislocation was changed to a sciatic and had to be left so. In one fresh case an iliac was changed to a forward dislocation and then finally reduced.—*Bruns' Beiträge f. klin. Chirurg.*, 1889, Bd. iv., heft 3.

X. On the Operative Treatment of Irreducible Traumatic Dislocations of the Hip-Joint. By K. KIRN (Tübingen). This article includes a description of the exsection of the dislocated

head of the femur in two cases at Bruns' clinic, together with a general consideration of the operative methods employed in these not rare cases. Relatively often the dislocation is not diagnosticated, and hence not reduced in time. It becomes irreducible much sooner than that of the shoulder, and, in fact, is occasionally so from the start. Then connective tissue fills up the socket and fixes the head in its new position.

Where the dislocation is forward (supra-pubic or obturator), a good anarthrosis may form, and the person walk fairly again; where downward (infra-cotyloid), the head may get a support against the border of the socket; and where upward (supra-cotyloid), against the spina anterior superior. Hence it is the much more frequent posterior dislocation that oftener calls for operative relief. Of 19 old dislocations of the hip that to date are known to have been subjected to operation, 11 were posterior, 4 anterior and 4 not stated.

The various operations in question are: (1) Attempts at forcible reposition. (2) Subcutaneous section of the retaining soft parts. (3) Osteoclasia. (4) Osteotomy. (5) Arthrotomy, resp., bloody reposition. (6) Exsection of the joint.

The first two of these methods have nothing in their favor. Osteoclasia as an accident in attempts at reduction has repeatedly led to a useful leg; 6 such cases from as many observers are specified. But certain dangers are incurred, especially that of necrosis of the femoral head when the fracture is through the neck. Osteotomy offers all the advantages of osteoclasia, besides a choice of the point of fracture, and yet without danger. He finds only one such case, that of Macewen.

Fiovani's method of reposition by laying the dislocated head bare and severing the retaining structures and adhesions has been done twice, once in a posterior dislocation by Vecelli with good result, and once also in an iliac by Polaillon, with death from sepsis. But in many other cases so great changes about the socket and head have been found, that the attempted operation was unsuccessful. Moreover, here also there is danger of necrosis of the femoral head.

Of his two cases of exsection, one occurred in pre-antiseptic times

and was fatal from pyæmia following erysipelas of the wound. The other case was a four-months old iliac dislocation. As even bloody reduction was impossible the head was sawed off at the base of the neck. Drainage, suture, wood-wool dressing, extension. In a month the patient was able to get about with a Taylor's apparatus, and in another month could walk very well (on a raised sole and heel). Two years later, the shortening was 3 cm, all motions free and painless, the patient walking about all day.

An abstract is given of 12 previously published cases of like exsection from various sources. Of this total of 14 cases, 4 ended fatally, though not from the operation, but from complications. The functional result in the 10 successful cases was very good, about half of these patients walking without a stick.

In summing up, he points out that osteotomy above or below the trochanter may in some cases suffice, by correcting the position of the leg, that bloody reduction is rarely possible, but that resection gives very satisfactory results.—*Bruns' Beiträge z. klin. Chir.*, 1889, Bd. iv., heft. iii.

WM BROWNING (Brooklyn).

XI. The Operative Treatment of Congenital Dislocations of the Hip. By DR. HOFFA (Wurzburg). The methods of treating congenital hip dislocations, either by orthopædic or operative means, have hitherto been devoid of good results. The resection of the head of the femur is to be rejected because the operation leaves a shortening of the extremity, and limping is not remedied. The first principle of all operations should be the preservation of the bony skeleton at the expense of the soft parts. The latter prevents the head of the femur from being drawn downward in the region of the acetabulum as a result of atrophy. Again, we must consider any defects of the acetabulum. In order to remove all resistance of the soft parts, a Langenbeck's resection incision is made, the capsule opened and a probe-pointed knife inserted, and all the muscular insertions around the great trochanter are divided subperiosteally, at times including a superficial layer of bone or cartilage. The head of the femur now becomes

perfectly mobile and can be drawn down in the vicinity of the acetabulum. If the acetabulum exists then the head is replaced by extension and direct pressure on the trochanter.

If the acetabulum is absent or only indicated, a curved incision is made along its lower border reaching to the bone, and the periosteum loosened and an acetabulum is chiselled out of the bone to the required extent. This is accompanied by very little difficulty, especially if the head of the bone is lifted out of the wound, and the thigh strongly adducted. The head of the bone is now placed in the newly formed acetabulum, and the periosteal flap and soft parts replaced over the head of the bone, and trochanter sutured securely to soft parts. Hoffa operated in his first case after this manner; in his other two cases the acetabulum was present, so that it was only necessary to remove the soft parts in order to give the acetabulum the necessary depth. If the soft parts on the anterior aspect of the acetabulum were too tense they were divided subcutaneously (*fascia lata*) at the anterior superior spine of the ileum. Hoffa has performed the operation five times and recommends it in children in whom the acetabulum is at least indicated. The function of the operated limb is not complete immediately after operation, inasmuch as the new acetabulum and the head of the femur are not in apposition. The apposition results later when the children begin to use the operated extremity, when the transformation of the bone takes place according to natural laws. This was illustrated by two cases, in one of which ten months after operation the function of the limb on the operated side was almost normal. The extremity is freely movable in all directions, and at the same time the head is fixed in the acetabulum. The great trochanter corresponds to the Roser-Nelaton line, and the extremity is $3\frac{1}{2}$ cm. longer than the one on the healthy side. In the second case an equally good result was obtained, and the child walks with normal gait.—*Beilage z. Centrbl. f. Chir.*, No. 25, 1890.

HENRY KOPLIK (New York).

XII. Irreducible Luxation of the Hip-Joint Treated by Operation. By OSCAR BLOCH (Copenhagen). The writer commu-

nicates the following case of irreducible hip-joint luxation treated by operation:

The patient, a man *æt.* 17 years, entered Frederick's Hospital. One hundred and three days before he received a blow upon the inside of his left knee, after which the limb remained abducted; he fell, heard a crack, and on attempting to rise he found that he could not rest his weight upon his foot of the injured side. A luxation of the left hip was diagnosed in a local hospital and according to the local physician, was reduced. After awakening from the influence of the chloroform the patient heard a loud snap. He remained seventeen days in the hospital, and was discharged, with free movement of the limb; but four or five weeks later his gait was limping and bent, and a prominence of the size and form of the head of the femur was found in the gluteal region. When he entered the hospital he could only walk a short distance, at the most, and was unable to work. There was present a pronounced lordosis of the lumbar vertebræ, which was straightened upon the femur, being flexed to an angle of about 45° . No difference can be seen in the position of the two extremities. Actively he can abduct and rotate the left extremity outwards, but this takes place from movement of the pelvis. If the pelvis be fixed, there is an elastic resistance to these movements. The *caput femoris* lies in the external iliac fossa. On strong passive flexion, a rasping sound is audible. The point of the trochanter lies about 5 cm. above Nélaton's line, and the left lower limb seems to be 3 cm. shorter than the right. Reposition was attempted three times under chloroform narcosis, but was in vain, and one hundred and twenty days after the accident an operation was performed. First, an exploratory incision was made between the rectus and sartorius muscles. The anterior surface of the capsule was opened by an incision 3 cm. long, and several tense bands were severed, and two attempts at reposition were made, but again in vain. The acetabulum was distinctly felt to be filled with firm masses. Langenbeck's incision for resection was then made to remove the head of the femur, when it was seen to be surrounded by a thin capsule of connective tissue, which was easily cut through. The head of the femur, in place of its normal, smooth and

bluish colored covering of cartilage, was found to have a yellowish, prickly surface, with small hollows. An attempt at flexion being made the head of the femur approached the edge of the acetabulum and rotated there, when it was seen that the uppermost part of the femur followed the movements, while the caput femoris itself stood still upon the margin of the acetabulum, and upon rotation, a slightly gaping fissure was discovered between the head of the bone and the shaft; the widest portion of the fissure was directed outwards. The shaft and head were only connected by a bridge of bone, about 2 cm. in breadth. The head was easily separated completely; the acetabulum being entirely filled with fibrous masses; a wedge-shaped piece was removed. The wound healed uneventfully. The extremity was, on measurement, found to be about 3 cm. shorter than the other. The pelvis moved with the limb. When discharged the patient could walk uninterruptedly for half an hour. Nine months later he presented himself again; he could then follow his occupation as carpenter, and walk two miles.

The writer has collected, besides his own case, thirteen cases of traumatic luxation of the hip joint treated by operation, which he communicates.

In recent irreducible luxations he would not operate at once, but wait until the reaction after attempts at reposition had passed away; the operation is especially contraindicated as long as excoriations or bed-sores, after extension-bandages, etc., are present, as these may be the source of infection. Often one will desire to repeat attempt at reposition. But if one should, in an entirely recent case, decide to operate, then arthrotomy with tenotomy should be done. If the case is one to one and a half or two months old, he would operate in those cases where one may with certainty diagnose impediments to reposition, and know that they can be surely removed. Operation, in the meantime, can only be performed when there is simultaneous fracture of the anatomical neck of the femur. The writer advises, rather primary extirpation of the caput femoris, than to try to have the fracture heal and then replace. In the greatest number of these cases where the hindrances to reposition can not be diagnosed,

he would let the cases run along two or three months under proper treatment, until one can decide whether one should operate or not; which, essentially, will depend upon the capability of the patients of working. If one decides to operate in those cases where the position of the limb is troublesome, osteotomy or, perhaps, osteoclasis will be the operation most likely chosen. In the remainder of the cases one may begin with arthrotomy; but as resection, as a rule, is required, the incision may be so done that the transition in the operative procedure may be easily made.—*Hospitals Tidende*, R. 3, Bd. 7, pp. 65, 97, 141.

XIII. Treatment of Coxitis; Forty-two Resections. By PROF. GRITTI (Milan, Italy). In the course of three and a half years Prof. Gritti has treated one hundred and twelve cases of coxitis; forty-two of which had undergone resection. Of the patients who were operated upon, seventeen died, which gives a mortality of 38%. Gritti describes this not very good result to the fact that many grave cases had been admitted to the hospital in too advanced a stage of the disease. Among the causes of death he mentions once shock and once pyæmia. In the other cases pulmonary and intestinal tuberculosis, exhausting suppuration and amyloid degeneration are enumerated as causes of death. Gritti advocates the early performance of resection. If severe nocturnal pain sets in, and a swelling in the gluteal region allows one to conclude that fungous granulations of the synovial membrane be present, then he advises not to wait until an abscess is formed, but to operate immediately. He removed in 19 cases the head only; in 23 cases he also removed the trochanter. Accordingly, in the cases which recovered, there was frequently a considerable shortening. Gritti could not make a comparison of the results of his procedure with those of the conservative treatment. He had carried out the conservative treatment in 70 cases with only 3 deaths; but all of these were only slight inflammations of the joint.—*Archivo di Ortopedia*, 1889.

F. H. PRITCHARD (Boston).

XIV. Wolf's Method of Redressement in Genu Valgum and Varum. By DR. J. WOLF (Germany.) In an elaborate paper upon this subject, including the pathology of the deformity, Wolf considers the condition as depending solely upon the functional adaptation of the bony and soft parts of the extremity to the persistent and frequent position of the leg in the line which constitutes the deformity. The treatment heretofore in vogue consisted either of a supra-condyloid osteotomy or some of its modifications (Macewan, Reeves, Ogston) or the slow and tedious method incident to orthopædic treatment. Wolf has introduced a method of redressement, which occupies a midway position in relation to the methods above mentioned, and which, although it does not give such rapidly brilliant results as the operative procedures alluded to, yet merits trial. It consists in applying, under an anæsthetic, a permanent fixation dressing (Alabaster, Plaster-of-Paris) to the limb in its deformed position, reaching from the ankle to the trochanter, and before this completely hardens the limb is grasped firmly and redressement performed, one assistant steadying the pelvis, while another grasps the internal condyle and forces it outward, the operator at the same time forcing the leg in an inward direction. (In genu-varum this is reversed.) When the normal position of the limb is approached as near as possible, the parts are held immovable until the plaster hardens. After two or three days, when the pains incident to the new position of the limb have disappeared, cuneiform pieces are removed from one or the other lateral aspect of the dressing (Mikulicz) according to the character of the deformity, further redressement performed; (the bandage being presumably thereafter reinforced) this process is repeated until the normal position of the limb is regained, this occupying from twelve to thirteen weeks, although, according to the author, the patient may resume his daily occupation as early as the third week.

Thus far the method has been only employed in children and young adults, but Wolf is convinced that it will be found useful in older individuals as well.—*Deut. Med. Woch.*, 1889, No. 50.

G. R. FOWLER (Brooklyn).

XV. A New Operation for Ankylosis of the Knee. By DR. HELFERICH (Greifswald.) It has hitherto been the custom in bony ankylosis of the knee to remove a wedge of bone corresponding in extent to the degree of angular ankylosis and to bring the sawed surfaces of bone in apposition as in all knee joint resections. In this manner a comparatively large part of the length of the limb is sacrificed, and we run the risk of wounding the intermediate cartilage, thus compromising in the young the growth of bone. Helferich proposes from an experience in his favorable cases, the resection of only a small bow-shaped wedge of bone with extensive open division of fasciæ and tendons in the hollow of the knee. By forced extension conditions are produced favorable to a non-bony fixed flexed knee-joint. We need remove but little bone. In some cases it is only necessary to divide the soft parts and only divide the bone with broad saw in an arched manner. The intermediary cartilage remains uninjured. Accurate position can be attained by superficial blows with chisel. The curved surfaces if they only fit approximately to each are favorable to bony union on account of their broad surfaces. Simple extension secures a good union. The fixity and steadiness are greater than in the hitherto practiced method. Helferich demonstrated cases treated in this manner with chain saw and showed photos of cases. He has practiced the division of tendons and fasciæ in the hollow of the knee by making a straight incision through the skin in the outer and inner side of the hollow of the knee and from this incision the division of the parts is carried out. König, in the discussion following above, mentioned a similar operation published by him some time ago. After a curved incision beneath the patella the bone is divided by a broad chisel; there is no danger of wounding the vessels. A smaller chisel completes the operation and the limb is put up in plaster. Hahn, of Berlin, operated in a similar manner with a chisel 1 cm. wide.—*Beilage z. Centblt. f. Chir.*, No. 25, 1890.

XVI. Results in Arthrectomies of the Knee. By DR. ANGERER (München). Angerer has performed 82 arthrectomies during the last four years in the polyclinic and children's clinic. Sixty-three

of these were those of children below 14 years of age. Angerer has concluded from the study of these cases that there is little danger in overlooking foci of disease which may cause subsequent trouble. Of the seventy cases operated upon up to August, 1889, primary union was obtained in 48. Ten of these cases were marked by a return of disease in loco. Eight of these returns were permanently cured by treatment of the fistulæ. The author prefers this arthrectomy to the typical resection, especially in the synovial form of tuberculosis not uncommon in the knee-joint. A bony focus of disease was found in 52 of the 82 arthrectomies. Thirty were cases of synovial tuberculosis. In 63 arthrectomies of children a focus of disease was found in 36 cases. The author recommends early movements and massage in arthrectomies in order to avoid subsequent contractures. He also advocates early arthrectomy, because the weakest children stand the operation well and the early operation protects the epiphyseal cartilage from the attacks of disease which might compromise subsequent growth.—*Beilage z. Centblt. f. Chir.*, No. 25, 1890.

HENRY KOPLIK (New York).

XVII. Arthrectomia Synovialis of the Ankle Joint, with Temporary Extirpation of the Astragalus. By DR. H. STROM (Norway). Ström carried out the proposition made in the *Centralblatt f. Chirurgie* (1889). He extirpated the left ankle-joint in a boy, æt. 15 years, who was suffering from tuberculosis of this joint. He opened the joint by means of Kocher's method. As he could not gain sufficient access to the tuberculous masses which he intended to extirpate, he removed the astragalus and after having extirpated carefully all the tuberculous tissue replaced it again. All the cartilaginous surfaces of the tibia, fibula, calcaneus, scaphoid and astragalus were removed. The cutaneous wound was brought together by sutures and two drainage tubes inserted. The patient was presented to the Christina Medical Society, on December 20, 1889, at which time he was practically cured; the foot was somewhat swollen, but the patient could stand on it well. The structure of the foot was solid and mobility nearly normal.—*Norsk. Ungaz. for Lægevidensk.*, March, 1890

ALBERT PICK (Boston).

XVII. A New Operation for Club-Foot. BY DR. MENSEL (Gotha). The author enucleated the bony nucleus in the neck of the astragalus of a patient suffering from congenital bilateral club-foot. The patient had had the regular orthopædic treatment for club-foot, but after forcible redressement of the feet, plaster and splint were applied, and after 8 days the patient contracted gangrene from pressure on both feet. During the process of granulation the feet not only became as bad (varus) as originally, but even worse. The cicatricial tissue was not favorable to the treatment in the regular way, and the author exposed the astragalus of the patient ($2\frac{1}{2}$ years old). At this age the astragalus is composed for the most part (body) of cartilage and the bone nucleus is situated in the neck of the bone. It was comparatively easy to expose the neck of the bone without opening either the scaphoid or ankle joint, and by cutting into the neck the bony center could be easily enucleated. The deformed bony nucleus may be very potent in the causation of the varus position, and after its removal the cartilage can easily be molded into a normal position. After removal of the above it was easy to bring the foot into good position without any great force, and cure was complete. The advantage gained is the retention of the body of the astragalus and the integrity of the ankle and scaphoid joints.

The operation is only indicated before the 3rd year, and author would only perform it when the orthopædic treatment is not possible.—*Beilage z. Centr. f. Chir.*, No. 25, 1890.

XVIII. The Treatment of Club-Foot by Forcible Reduction. BY PROF. KONIG (Göttingen). Author has treated during the past 5 or 6 years all cases of club-foot, without exception, by forcible reduction. He has, on account of his bad experience, entirely abandoned the bloody operations, which have for their object the removal of a part of the bony skeleton (talus or a wedge of the tarsus). The results of club-foot operations in the Göttingen clinic have, in consequence, been very good. In only very exceptional cases have heavy instruments for reduction, which grasp the anterior part and posterior portion of the foot, respectively, been used. These instruments have

been abandoned in favor of the hand of the operator, with the aid of a point of support. The plantar aponeurosis and Achilles tendon are divided before operation (which is done in narcosis). We must not expect to accomplish everything in one sitting, for this three or four sittings are sometimes necessary. The most favorable are the club-feet from the 5th to the 20th year, and especially those of the age of puberty. The purpose is to press together the bone toward the side of the convexity of the curvature, and to tear the bands and ligaments on the concavity. The procedure consists of two acts: The first act is to overcome the adduction. The extremity of the patient is turned on its outer side, having fixed the knee and leg. There is on the table a piece of wood, covered with towel, similar to a Volkman's railway splint. The convexity of tarsus of the foot is placed on the summit of this block of wood, and grasping the anterior part of the foot with one hand, and the tarsus and heel with the other, the attempt is made to bend the foot forcibly inward, bringing the whole body weight of the operator into play. The position of the foot is changed from time to time so that the force is brought to bear on the metatarsus, and again on the dorsum, of the foot. If the foot crunches and yields the second part of the operation follows. The child is brought in the dorsal position, and the knee being fixed, the forefoot is forcibly brought into dorsal flexion and abduction. Both the above acts must be repeated several times (two or three) in one sitting. After the operation a bandage is applied which retains the foot in the position attained. In some cases one sitting is sufficient, and after fourteen days the foot is placed in splint and shoe of Roser, and active and passive movement made. If not, a second sitting is necessary, and the patient is not discharged until he stands and walks with a fully abducted and externally rotated foot.—*Beilage z. Centrbl. f. Chir.*, No. 25, 1890.

HENRY KOPLIK (New York).

REVIEWS OF BOOKS.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS, With Especial Reference to the Application of Remedial Measures to Disease, and Their Employment upon a Rational Basis. By HOBART AMORY HARE, M.D. Philadelphia: Lea Brothers & Co., 1890.

This contribution to the literature of therapeutics is the work of one well known as a scientific investigator and practical authority. There are not lacking many and good books in this department, but it does not follow that there is no field for further publication, even if we set aside the consideration of the accumulating fruit of observation and experiment, or the right to a hearing on the part of so well equipped an author. There is much to be gained by rearrangement of knowledge already in possession, both for the purpose of co-ordinating and correlating the parts of such knowledge, and of getting the most useful mental perspective. This consideration seems especially applicable in the field of therapeutics, where the amount of material is so great, and its source and value so diverse. In no other department do we have so intimate a blending of the rational and empirical. Nowhere else has the investigator been rewarded with such brilliant discoveries, the fruit of logical deduction, at one moment, only to stand the next baffled before some clinical fact as incontrovertible as it is inexplicable.

But the attitude of the modern scientific mind is one of scant tolerance of such a miscegenation, and there is almost a savor of ill-repute attaching to therapeutics of to-day, the expression "rubbishin" being recently flung at certain newly accredited drugs, by a surgeon of world-wide fame. The task of the latter-day therapist is to remove this opprobrium, and place the teaching and practice of therapeutics where it will command the respect of the most exacting. Empiricism has had

a long start in the race with rational methods, but its step is slow and its course all but finished, while the champions of the new order are fast gaining the day; and to publish their work is to aid in scientific progress.

It is in this consideration that we find the *raison d'être* of this work, the key-note of the author's aim appearing in these prefatory words: "The writer has endeavored to bring together in a readable form the combined results of laboratory and bedside experience, thinking the time ripe for such a task. * * * He desires to weave science and practice into so close a network that the foundations of experience may be cemented by the mortar of exact knowledge."

This book is divided into four parts. Part I is devoted to general therapeutic considerations, the author opening with a defence of medical therapeutics, and pointing the way between the Scylla of excessive doses and the Charybdis of nihilism.

Part II comprises "Drugs." These are taken up in the order of their English nomenclature, a plan to be commended, since drugs can not satisfactorily be grouped in one system, either from their physiological action or therapeutic application, while to class botanical drugs under such heads as "*Thalamifloræ*," or "*Monocotyledones*," is to invite at once amusement and despair. We notice with satisfaction the absence of pictures of medicinal plants, and of pharmaceutical directions, in a work of this nature. Huxley aptly characterizes the practical aspect of such things when he says: "It is all very well that the physician should know that castor oil comes from a plant, and castoreum from an animal, and how they are prepared; but for all the practical purposes of his profession that knowledge is not of one whit more value than the knowledge of how the steel of his scalpel is made."

The author's experience with Agaracin has been strangely negative in controlling night-sweats, and certainly does not accord with that of many observers, in whose hands it has often proved of benefit, in doses less than a tenth of that here suggested.

In speaking of aloes Dr. Hare says: "It is distinctly harmful if used constantly for any length of time, as it seems to produce atony of the bowel." This is in marked contrast with the teaching of most author-

ities, notably Lauder Brunton, who states that "aloes differs from other purgatives in not causing subsequent constipation, but, on the contrary, rendering the intestine more sensitive.

The question as to the comparative danger attending the use of chloroform or ether for anæsthesia is treated as might be expected from a collaborator of Wood, and a disciple of the extreme American school. Without going into detail the author states that chloroform kills by cardiac or respiratory arrest, or both,—in any form more readily than ether, and that with certain classical exceptions its use is unjustifiable when ether can be obtained. The practical directions for the administration of ether, and the prevention and treatment of untoward symptoms arising during its use, are concise, but adequate, and not altogether second-hand.

The section on drugs is good, without possessing superlative excellence; its merits lying rather more in arrangement and judicious elimination than in actual contents. The new drugs, good, bad and indifferent, are handled with discrimination. Among minor criticisms of particular drugs may be mentioned the absence of allusion to the surgical uses of Naphthalin; or the diuretic properties of sugar of milk, the scant reference to the value of morphine as a heart supporter, especially in cases of shock; and the dosage of potassium iodide, which is small, and often inadequate. There are numerous cross references to other parts of the work, adding to its usefulness.

Part III deals with "remedial measures other than drugs, and foods for the sick." Cold and heat are the main subjects here treated, and these are discussed at some length. The author is an enthusiastic advocate of the use of cold as an antipyretic in sthenic fevers. The article on Antiseptics is elementary, but properly so, if indeed it is at all called for in a purely medical work.

Part IV is devoted to diseases, and is by far the most valuable section of the book. The opening subject is Abortion, and later the author treats of the diseases of the Puerperium. These are well handled but it may be questioned whether they are not as well left to the department of midwifery, especially since in the view of the author such a subject as electricity has no place in his work. All the more

important diseases are taken up, and some of less moment. Epilepsy is exhaustively treated. The article on Fever is especially good, from a practical, literary and scientific point of view. The author considers that "we have only three measures for the relief of fever which are reliable, and have stood the test of time," viz., "antipyrin, acetanilid and the use of cold;" not greatly valuing phenacetin as an antipyretic; and, indeed, he is cautious in his endorsement of any drug intended to lower temperature. His criticism of the conclusions drawn by Naunyn from his experiments on rabbits subjected to prolonged pyrexia is exceedingly well directed. No attention is called to the fact that in the presence of a high temperature several doses of an antipyretic at reasonable intervals often produce no effect, until finally an apparently cumulative influence develops, and the patient's temperature very suddenly drops many degrees in an alarming manner.

Under Peritonitis, the relative merits of the use of opium, and of the salines are set forth at some length, the author apparently wishing both forms of treatment well, and finding appropriate cases for the use of each, though not advocating their combination.

The articles on Pneumonia and Rheumatism are to be commended, especially the latter, the necessity of larger doses of the salicylates than are usually given being emphasized.

The book ends with an index of drugs and remedial measures, and another of diseases and remedies, of considerable value.

A search for the reasons of things characterizes this work, although the author frankly admits all well established clinical facts. He is enthusiastic for a finally complete rational basis for therapeutics, and is himself a fruitful worker in that direction. The American profession justly consider their therapeutic standard an elevated one; and it is by such works as this that the position already occupied is adequately maintained.

JAMES S. REEVE.

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